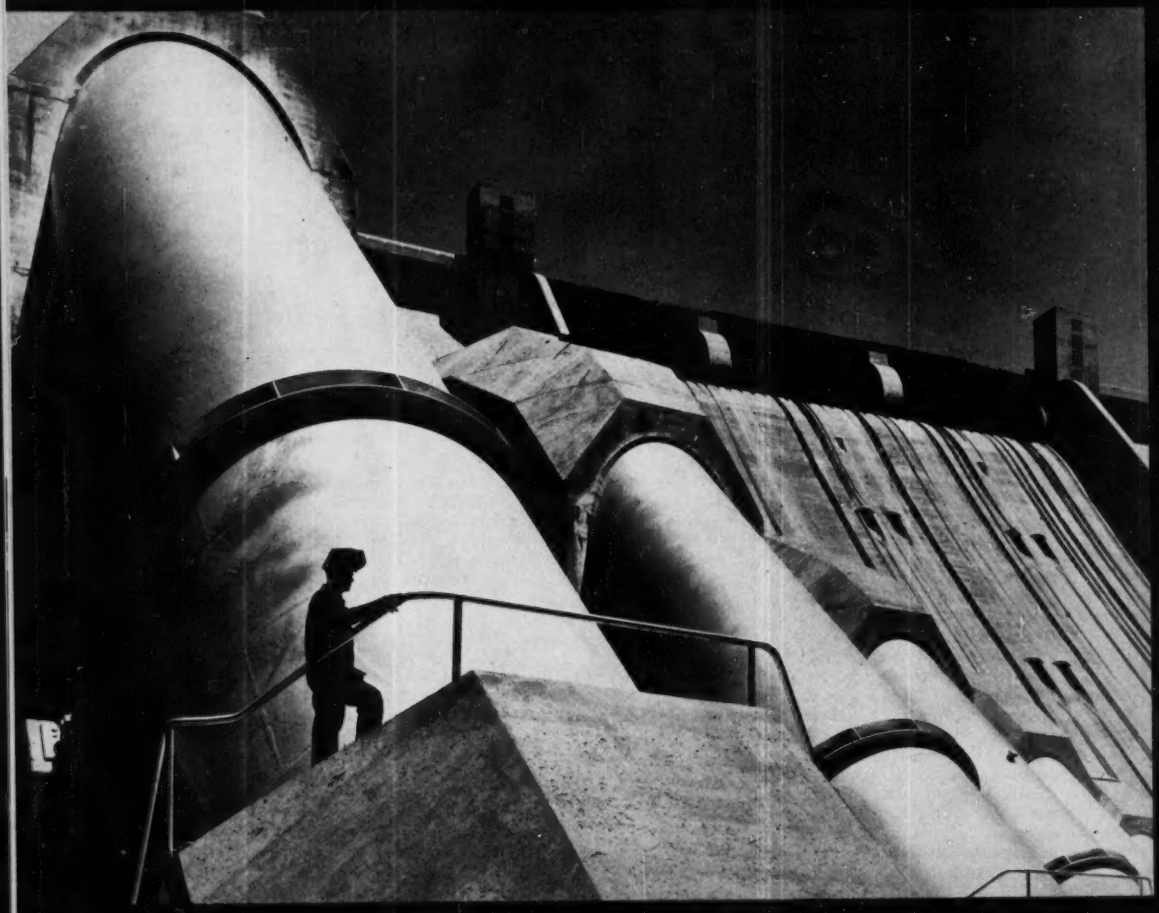
ENGINEERING NEWS-RECORD



A McGRAW-HILL PUBLICATION

COMMERCIAL BUILDINGS

PRIVATE HOMES

CLUBS

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BANKS

Here's how

BYERS SNOW MELTING SYSTEMS

Came Through Last Winter's Toughest Tests

Last winter's record-breaking snowfalls gave Byers Snow Melting Systems a real workout. The above illustrations are typical of the results and suggest the wide variety of applications using this modern snow removal method. The coils of Byers Wrought Iron pipe, embedded in the sidewalk or pavement and carrying hot water-antifreeze solution, made the heaviest snow vanish magically as it fell.

Satisfied users everywhere are constantly adding new chapters to the snow melting success-story. Householders find snow melting an economical luxury. Stores, hotels and service stations have cut excessive snow removal costs and enjoy increases in patronage. Industrial plants keep shipments moving, ban lost time at shift changes by using snow melting systems in loading platforms and access roads. This ever-increasing acceptance is explained by remarkable performance records like those above.

Byers Wrought Iron pipe is ideally suited for this service because of its combination of essential qualities. Its corrosion resistance has been repeatedly proven. Its heat emission is high. It is easily formed and welded. It expands and contracts at virtually the same rate with concrete. And it has ample mechanical strength to withstand damage during installation.

NEW BULLETIN ON SNOW MELTING. This new bulletin covers the entire field of snow melting—design, installation, operation . . . and explains why dependability demands the use of Byers Wrought Iron pipe. Write for your copy.

A. M. Byers Company, Pittsburgh, Pa. Established 1864. Boston, New York, Philadelphia, Washington, Atlanta, Chicago, St. Louis, Houston, San Francisco. Export Division: New York, N. Y.

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This notch-fracture test specimen illustrates the unusual fibrous structure of wrought iron—which is responsible for the unusual corrosion resistance of the material. Tiny threads of glass-like silicate slag, distributed through the body of high-purity iron, halt and disperse corrosive attack, and discourage pitting and penetration. They also anchor the initial protective scale, which shields the underlying metal.

BYERS

CORROSION COSTS YOU MORE THAN WROUGHT IRON

WROUGHT IRON

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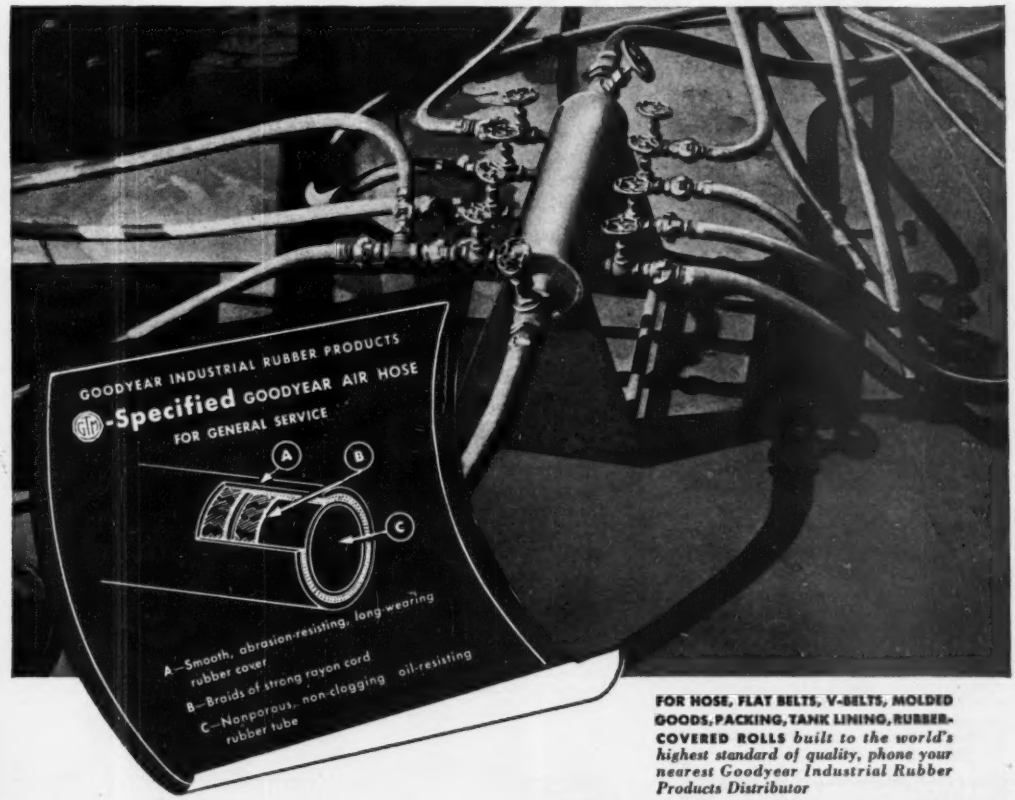

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sight upward and downward with extreme accuracy
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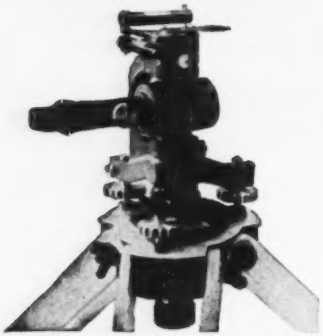

- **Align elevator shafts accurately, speedily . . .**
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Company .....
Address .....
City ..... Zone ..... State .....

ENGINEERING NEWS-RECORD

ABP Member ABC

Volume 146 APRIL 12, 1951 No. 15

WALDO G. BOWMAN
Editor

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IS MORE THAN A CHANGE OF BOOMS!

CONVERSION means more than changing a boom! It means fitting a piece of equipment for a different class of work!

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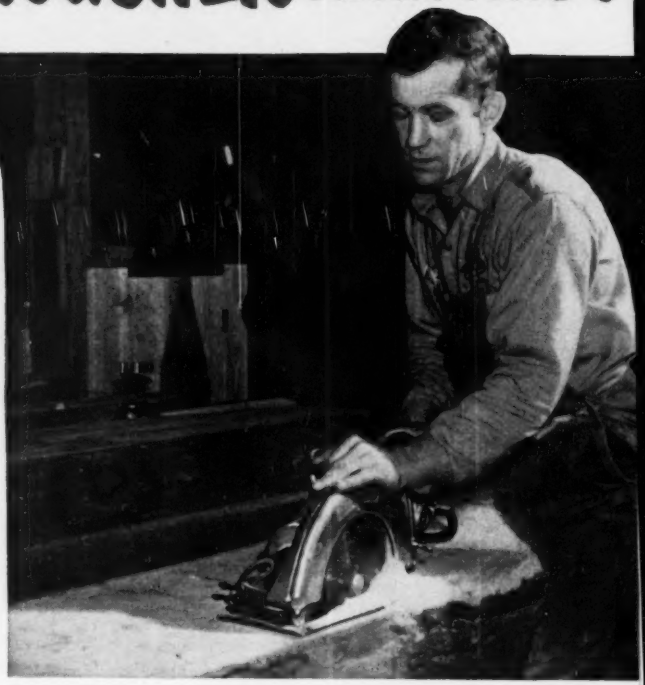
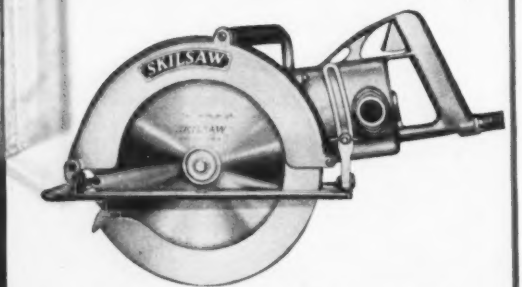
CRAWLER and TRUCK MOUNTED SHOVELS • CRANES • DRAGLINES • PULLSHOVELS

They don't come TOUGHER than this!



SKIL Saw Model 127 cuts 7" rough oak timbers for shrimp trawler keels

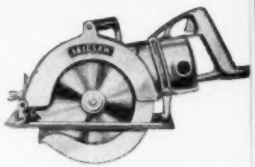
Here's another example to prove the tough kind of work SKIL Saw Model 127 can do on your jobs every day, all day long. This saw is fast cutting, smooth running, balanced for easier control and operation. Power-packed for heaviest duty cutting: mine and bridge construction or shoring—timbers for dam and dock superstructures—railroad ties. Cross-cuts or rips green and heavy lumber. With the suitable blade it scores and cuts hard, dense building tile and heavy gauge metals.



Capacity: 4⅜" maximum, copper up to ⅝", lead sheets up to 1". 2400 r.p.m. Base adjustments: 2⅜" to 4⅜" vertical depth of cut; bevel adjustment 0° to 45°—3¼" depth of cut at 45°. Overall length: 22". Weight: 34 lbs.

10" saw with extra power, complete dependability

SKIL Saw—Model 107—Heavy duty gearing gives high-torque performance, maintains blade speed under such loads as heavy timbers and tough, green or resinous woods. Cuts and scores all types of stone and masonry materials, metals.



Capacity: 3⅜" maximum. Base adjustments: 1" to 3⅜" vertical depth of cut; 0° to 45° bevel adjustment; 2⅜" depth of cut at 45°. Overall length: 21". Weight: 31¼ lbs.

Heavy duty drills, lighter and more compact

SKIL ⅝" Drill—Model 2103—Lighter and more compact than any drill of comparable power and capacity. Easy to handle. Perfect balance. Packed with power for heavy, continuous work in timber or steel. One of 25 models—a SKIL Drill for every drilling problem.

Capacity: in steel, ⅛" to ⅝"; in hardwood, ⅛" to 1½"; steel reaming, ⅜". 450 r.p.m. Overall length: 16⅛". Weight: 14¼ lbs.

Your nearby SKIL Distributor will give you demonstrations and complete information on the complete line of SKIL tools.

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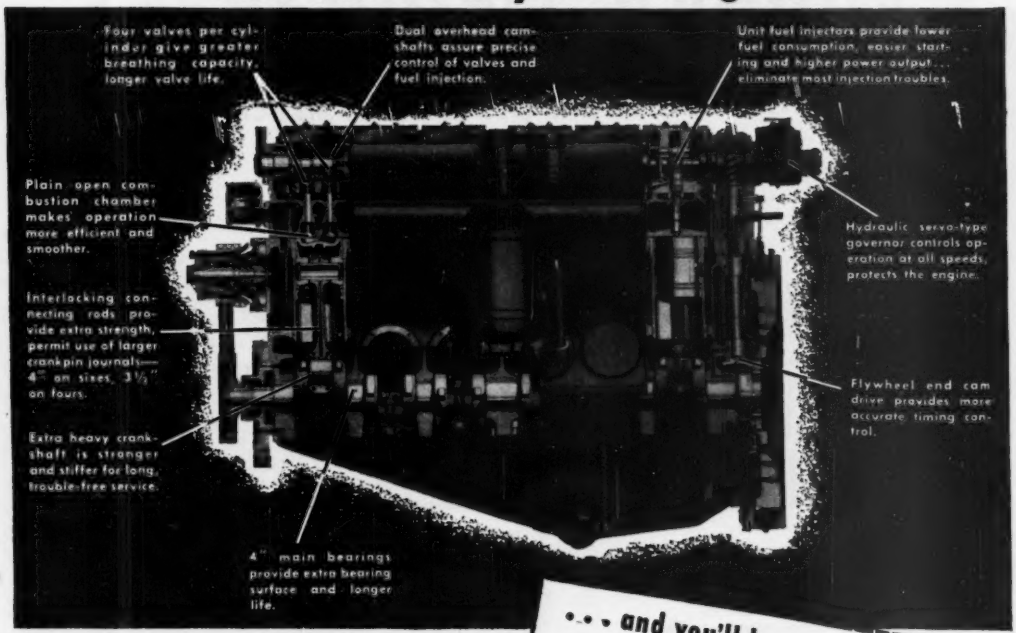
Compa MURPHY DIESEL esign

with that of any other engine


Four valves per cylinder give greater breathing capacity, longer valve life.
Dual overhead camshafts assure precise control of valves and fuel injection.
Unit fuel injectors provide lower fuel consumption, easier starting and higher power output... eliminate most injection troubles.
Plain open combustion chamber makes operation more efficient and smoother.
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- **GREATER ECONOMY**
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Heavy duty power

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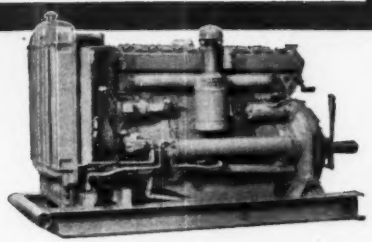
Murphy Diesel Engines and Power Units for construction, 90 to 226 H.P., 1200 and 1400 RPM. Generator Sets, 60 to 140 K.W.



ONLY with Murphy Diesel do you get all the advanced design features described above . . . and only with Murphy Diesel do you get all extra power, economy, dependability and engine life that this design assures. Proved in thousands of hours of the toughest kind of service, this design has resulted from skilled engineering and long practical experience.

A more detailed discussion of these features and others is given in the booklet, *"10 Questions to Ask a Diesel Engine Salesman."* You can get a copy from your Murphy Diesel Dealer or we'll be happy to send you one.

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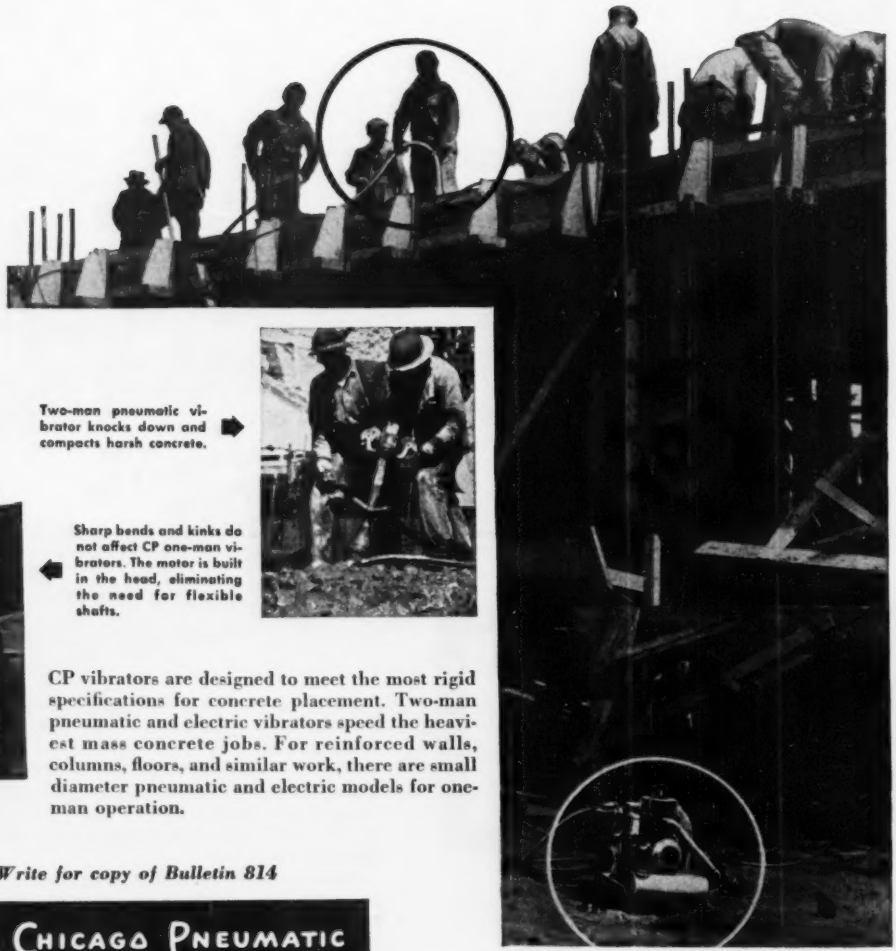
Sales, parts and service in principal centers

Vibrator Frequencies

that meet concrete placement specifications



Two-man pneumatic vibrator knocks down and compacts harsh concrete.

Sharp bends and kinks do not affect CP one-man vibrators. The motor is built in the head, eliminating the need for flexible shafts.

CP vibrators are designed to meet the most rigid specifications for concrete placement. Two-man pneumatic and electric vibrators speed the heaviest mass concrete jobs. For reinforced walls, columns, floors, and similar work, there are small diameter pneumatic and electric models for one-man operation.

Write for copy of Bulletin 814

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General Offices: 8 East 44th Street, New York 17, N. Y.

PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES
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The power unit is spotted out of the way and requires no handling or frequent moving. Only the vibrator goes up on the form.

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Get Things Done!

● Extra effort – that's the order of the day as American industry swings into high gear to meet the growing demands of the nation's expanding defense program.

Nowhere is this more important than on vital construction work and on the job of keeping raw materials flowing from the mines, the forests and the oil fields.

Here's work that's cut out for Mack trucks... jobs where big Macks show at their best in *extra* strength and stamina, *extra* performance and *extra* dependability.

Your nearest Mack branch or distributor will show you how Mack's exclusive design and construction can boost output on your particular job... *get things done* faster and at lower cost. You'll find it's a story well worth hearing.

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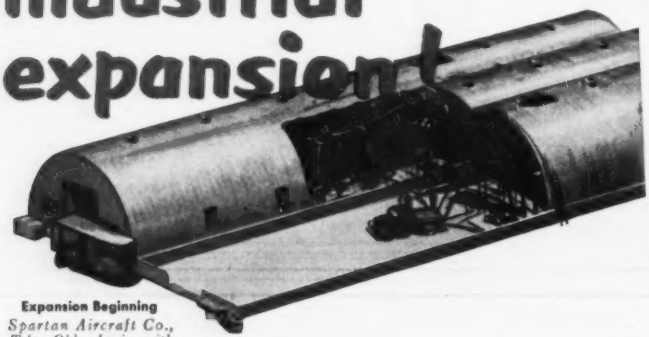
Mack Trucks, Empire State Bldg., New York 1, New York. Factories at Allentown, Pa.; Plainfield, N. J.; Long Island City, N. Y. Factory branches and distributors in all principal cities for service and parts. In Canada: Mack Trucks of Canada, Ltd.

Model LRSW six-wheel SUPER MACK truck really "gets things done" in strip mining and excavating work—handles its 30-ton loads with round-the-clock dependability.

THE ANSWER TO THE NATION'S NEED . . .

for fast industrial expansion!



Expansion Beginning
Spartan Aircraft Co., Tulsa, Okla., begins with 15,200 square feet of floor area. Note completed building below.

Build Quicker with QUONSETS

IDEAL FOR FACTORIES, WAREHOUSES, MACHINE SHOPS OR STORAGE BUILDINGS

For additions to your present plant—or for new plants—Quonsets mean *fast* completion, economy of materials, adaptability to *any* use. Also, when plants need expansion, you can add Quonset to Quonset, according to the need.

Made of N-A-X HIGH-TENSILE steel, Quonsets provide non-combustible construction and permanence far surpassing less modern buildings. They require little upkeep—are easily maintained. Let Quonsets serve you.

GREAT LAKES STEEL CORPORATION
Stran-Steel Division, Ecorse, Detroit 29, Michigan

Expansion Completed
Additional Quonsets, with extensions and connecting arches, provide Spartan Aircraft Co. with a total of 35,600 sq. ft. of floor area.

NATIONAL STEEL CORPORATION

Stran-Steel and Quonset Reg. U.S. Pat. Off.

NEWS BRIEFS

Getting monotonous—R. J. Callahan of the R. J. Callahan Engineering Co. of Springfield, Ill., reported to the police March 16 that his office had been entered and ransacked six times since last Nov. 1. Nothing was taken, but Mr. Callahan wants the police to stop the intrusions as he is tired of buying new locks for his door.

Crime does not pay—Erwin J. Gould, 56 year-old Grand Rapids, Mich., construction head, has been sentenced in Los Angeles to 18 months in prison and fined $5,000 after a jury found him guilty of defrauding the government through illegal use of veterans' priorities. Gould and one other were accused of obtaining a surplus tractor for $4,200 and a surplus crane for about $4,500 from the War Assets Administration by using priorities of two war veterans who were employees.

There's gold in them thar dumps—Hartford, Conn., officials have discovered that there is profit in city dumps. City Sanitary Engineer Lyman C. Lovell saw numerous scavengers going through the tons of refuse being unloaded on the North Meadows, so he suggested that the city seek bids from junk dealers for the exclusive right to the rubbish. The highest bid was $404 a month by John Brown. He got a contract with the city treasurer and is making money on the deal.

Houses just like the sample—A bill introduced into the Delaware legislature would require that every person, association or corporation selling houses prior to completion through use of a sample house must post with the state treasurer a $10,000 bond guaranteeing duplication of the sample house. Any variation from the sample, unless specifically set forth in detail in each contract of sale, would be considered a violation of the proposed law.

75-year-old pipe gives way—Lead filling in a pipe joint eaten away by its 75 years of service in the Beverly, Mass., water system, was the cause of a recent break that resulted in several thousands of dollars of damage to streets and property. Dodge street, where the break occurred, was flooded to a depth of three feet for a quarter of a mile. The main carried water from Wenham Lake to Folly Hill Reservoir.

The 5,000,000th postwar home—The National Association of Home Builders has awarded to Harold J. Cosby, a home builder and engineer of Dallas, Tex., the honor of having finished

(*Continued on page 10*)

FOR YOUR MINING & STRIPPING OPERATIONS

Type "HS"

HENDRIX Heavy Duty BUCKETS

Easily renewable Manganese Steel Shoes for bottom runners and corner wearing plates... those parts that take the brunt of abuse... are standard equipment on all HENDRIX TYPE "HS" Heavy-Duty Buckets.

Because Hendrix Dragline Buckets are low in upkeep and long in life, they represent extra value and economy in your digging operations. Because they are engineered to "take it," even on the toughest jobs, they insure full production. Because replacement parts are quickly and easily installed, maintenance costs are kept down to a minimum.

HENDRIX "HS" Heavy-Duty Buckets are widely used for stripping coal and for moving shale, rock, or any hard formation.

For descriptive literature ask your dealer or write

HENDRIX *Lightweight* **DRAGLINE BUCKETS**

HENDRIX MANUFACTURING CO., INC.

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THIS TRADE-MARK IS

RECOGNIZED AND RESPECTED

WHEREVER ENGINES ARE USED

Continental Red Seal power is speeding progress and cutting costs at practically every stage of construction work, from excavation right on through final grading. You find it in various specialized types of road-building and earth-moving equipment; in conveyors, hoists, industrial trucks and other materials handlers; in mixers, compressors, welders and standby generator sets, as well as in many of the vehicles which haul materials to the job.

There's always a reason for such preference as Red Seals have come to enjoy, and in the case of powered equipment, that reason is *performance*, of course. Red Seals run dependably, day in and day out, because each model is engineered expressly for one job. When you find a Red Seal in a given make of specialized machine, you may be sure that having been built with one application in mind, it will do its work superlatively well.

And when you *buy* equipment in any of the far-flung fields which Continental Motors serves, it will pay you to choose a make with Continental Red Seal engine. The Red Seal emblem commands respect wherever power is used.

GOOD EQUIPMENT IS BETTER WITH CONTINENTAL RED SEAL POWER

Continental Motors Corporation
MUSKEGON, MICHIGAN

the house which is the 5,000,000th built in the United States since the end of World War II. The house is in Dallas and it is a $16,000, three-bedroom brick one with central heating and a 2-car garage. Cosby has built about 100 homes in Dallas since 1945. In 1930, he was an engineer with the United States Public Roads Administration at Fort Worth. In the war he served in the Army Engineers Corp.

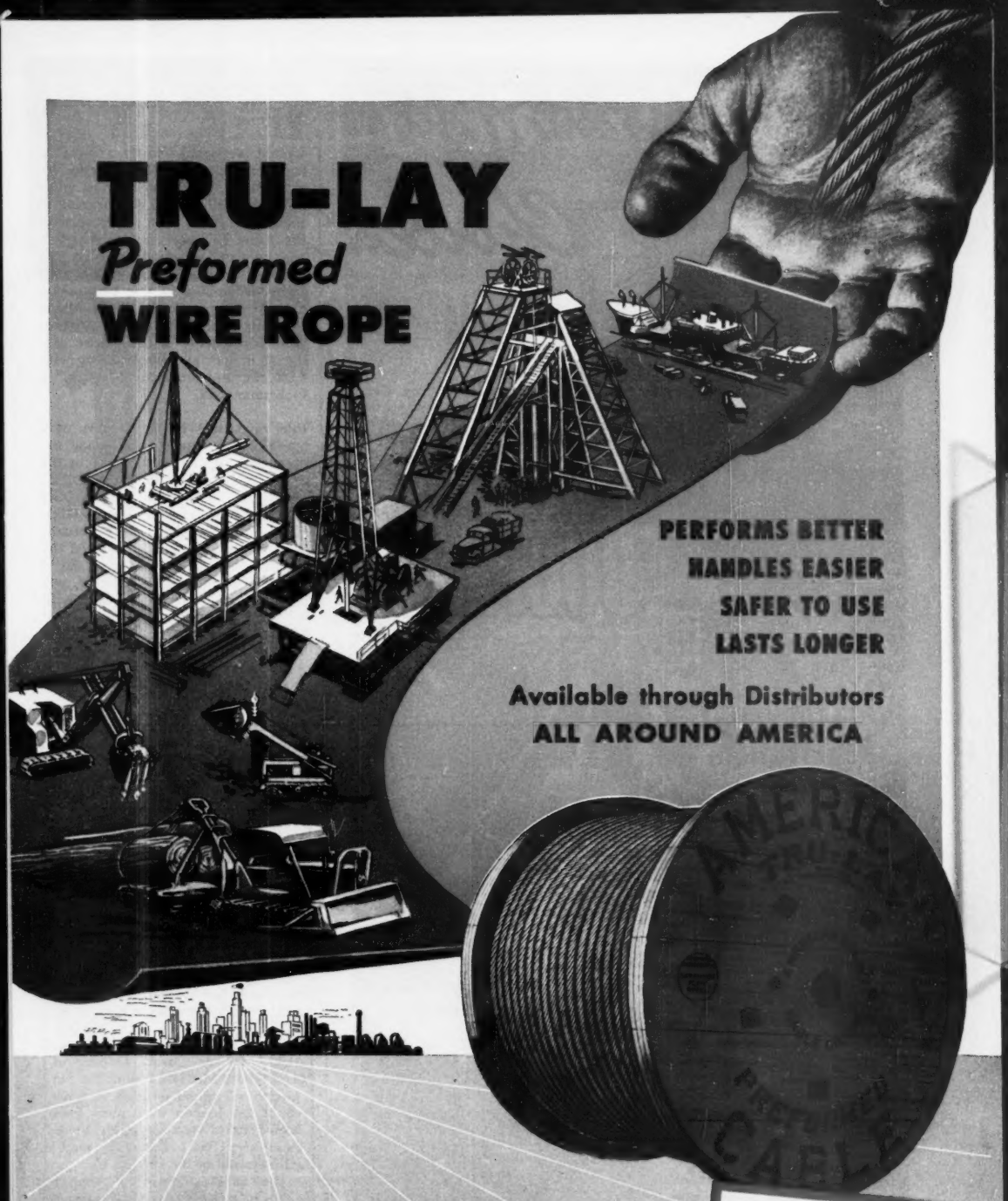
Water discovery—Large buried valleys carved in the bedrock of Seneca County, N. Y., containing important groundwater reservoirs, have been discovered in the course of groundwater investigations in New York State, it is revealed in a U. S. Geological Survey report on that county in the Finger Lakes region.

Scrap granite industry—A $100,000 a year industry was created for a small Canadian town when Eugene Robitaille, operator of a granite quarry at St. Joseph D'Alma, Que., decided to use some bits of waste stone from his quarry to help a priest build a church. Brick was not available to put on the reinforce frame so the outside walls of the church were covered with red and black scraps of granite blocks. The parish saved $15,000 on the contract. Now Robitaille ships thousands of tons of scrap granite to Quebec, Montreal, Ontario and the United States. He uses about half of the granite that formerly went to the scrap pile.

Roads needed—A western Nebraska highway improvement program is being organized. Chambers of commerce of 25 communities became active in this matter following the defeat at the polls last November of two road revenue proposals. It is said that roads are inadequate through a wide area of the western part of the state.

Old timer—The Congressional Record recently celebrated the case of Joseph H. McGann, Sr., the man who parlayed an eight weeks' temporary assignment on Capitol Hill into a 49-year government career. It is noted that McGann has just completed 49 years in the employ of the House Rivers and Harbors Committee and its successor, the Public Works Committee. Now the chief clerk of the commission, and a recognized expert on rivers and harbors, McGann began as a stenographer for a Cleveland shipping firm in 1902. When the bid came in asking for a stenographer for eight weeks to help Congress work up a big rivers and harbors bill, McGann

TRU-LAY
Preformed
WIRE ROPE



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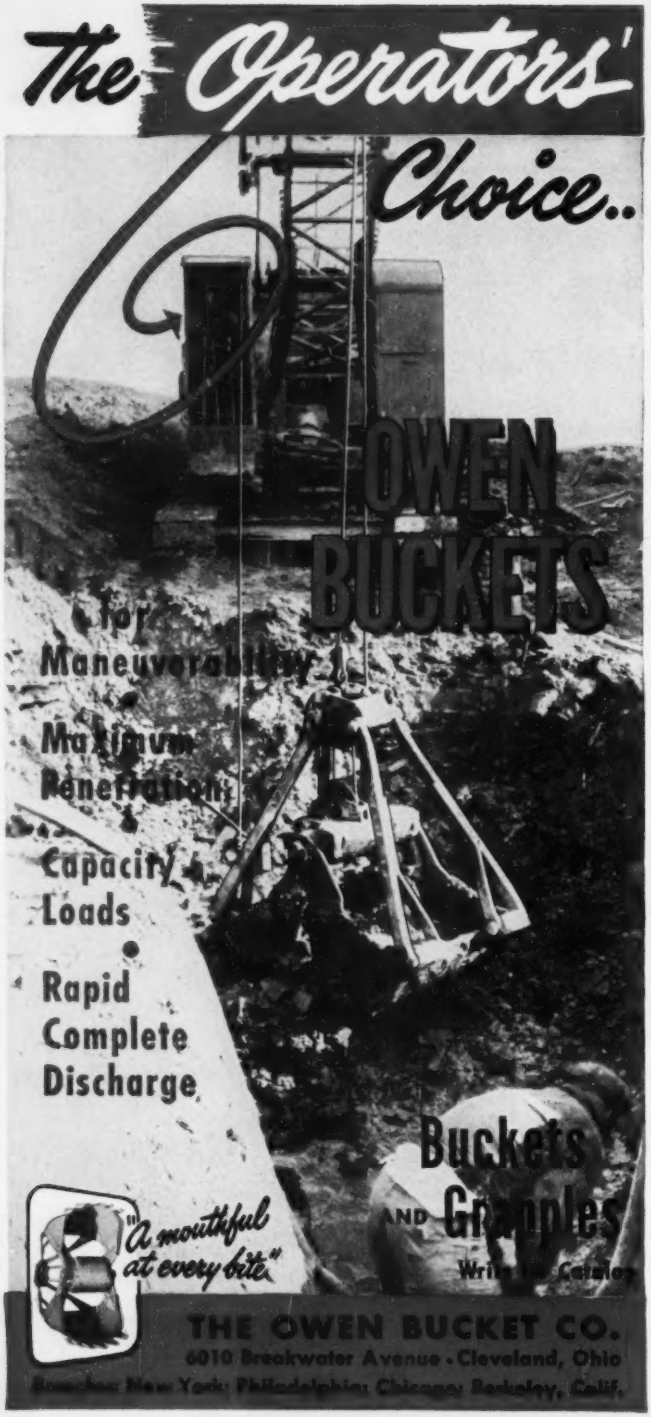


applied and was accepted. He stayed on. Now 78 years old, he is still going strong.

United we stand—Nearly a score of contractors in Maine have banded together to demand that they be given a fair share of defense construction in their state. They have conferred with the Army Engineers in Washington, and are also contacting the Navy and Air Force. The contractors are planning to combine in one corporation to represent practically all the Maine contractors and construction workers. "We have plenty of equipment, personnel, money and brains, along with resources, and are ready to work," a spokesman said.

Inlet or outlet?—Engineers have written us contending that we made improper use of the term "inlet" in the article on page 46 of the Feb. 22 issue. This article describes an inlet in a reservoir where water is taken into a water supply system. Actually as far as the reservoir is concerned the structure described is an outlet. So, if you are a water supply engineer, you probably are perfectly satisfied with the term inlet as used. However, if you are a hydraulic engineer, we suggest that you substitute the word outlet every time the word inlet is used in that article.

THE COVER

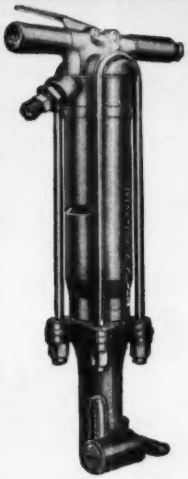
California's Central Valley will be the scene of much jubilation next Aug. 1-10 when about $350 million worth of completed reclamation works go into first fully-integrated operation.

Celebration will start with a release of water at Shasta, northernmost structure in the 500-mile-long valley, and continue through the ten days it will take the water to flow through the CVP system.

From behind 602-ft-high Shasta Dam water will flow down the Sacramento and through Delta Cross Channel to be lifted 200 ft at Tracy Pumping Plant to the headworks of 117-mile Delta Mendota Canal. Delivery of 4,600 cfs to Mendota Pool of the San Joaquin will permit diversion of 4,000 cfs of San Joaquin River water from behind Friant Dam through 153-mile Friant-Kern Canal to Bakersfield—southern extremity of the system.

Investment to date is just over half of the estimated cost of the authorized development. The U. S. Bureau of Reclamation envisages big things ahead for California—now second only to New York State in population.

K ...is for the Knockout power in JOY PAVING BREAKERS

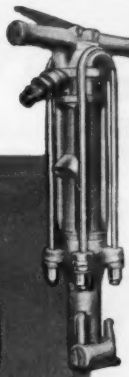


K-89... New Super heavyweight

There's real knockout power in this 90 lb. super breaker. The K-89 is designed to speed up demolition of those extra tough-and-heavy reinforced concrete sections, etc. Like all Joy SILVER STREAK Paving Breakers, the K-89 is cadmium-plated inside and out, which prevents rusting, eliminates scoring and aids lubrication.

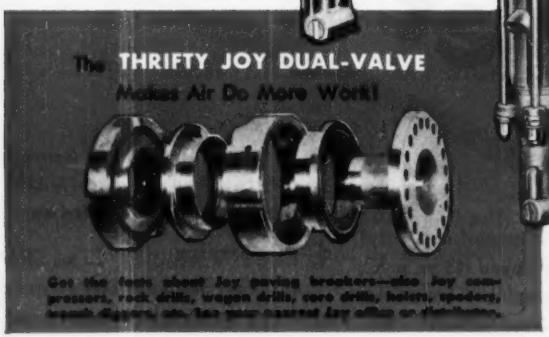
K-81... heavyweight

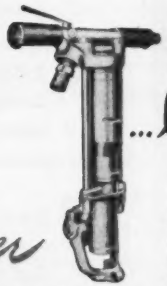
Handles tough demolition jobs economically and efficiently—breaks more concrete because it strikes more and heavier blows, and because it's easier to hold. Outstanding features of the K-81 include the exclusive Joy "Dual Valve," flat-sided cylinder for easy holding against operator's leg, replaceable chuck bushings, "U" type side rods and rugged cam-type retainer.



K-61...medium weight

Specially suited for thin-section concrete and other light demolition jobs—hard-hitting and easy-handling like the K-81, but lighter in weight. Many of the parts, such as the chuck housing, chuck bushing and throttle, will fit both the K-61 and K-81—a considerable saving in repair parts stock.





K-31 ...lightweight

Only 30 lbs.—a powerful, easy-handling little breaker that's ideal for light demolition and all work where the operator must support the entire weight of the tool, or where footing is not solid, as on scaffolds.

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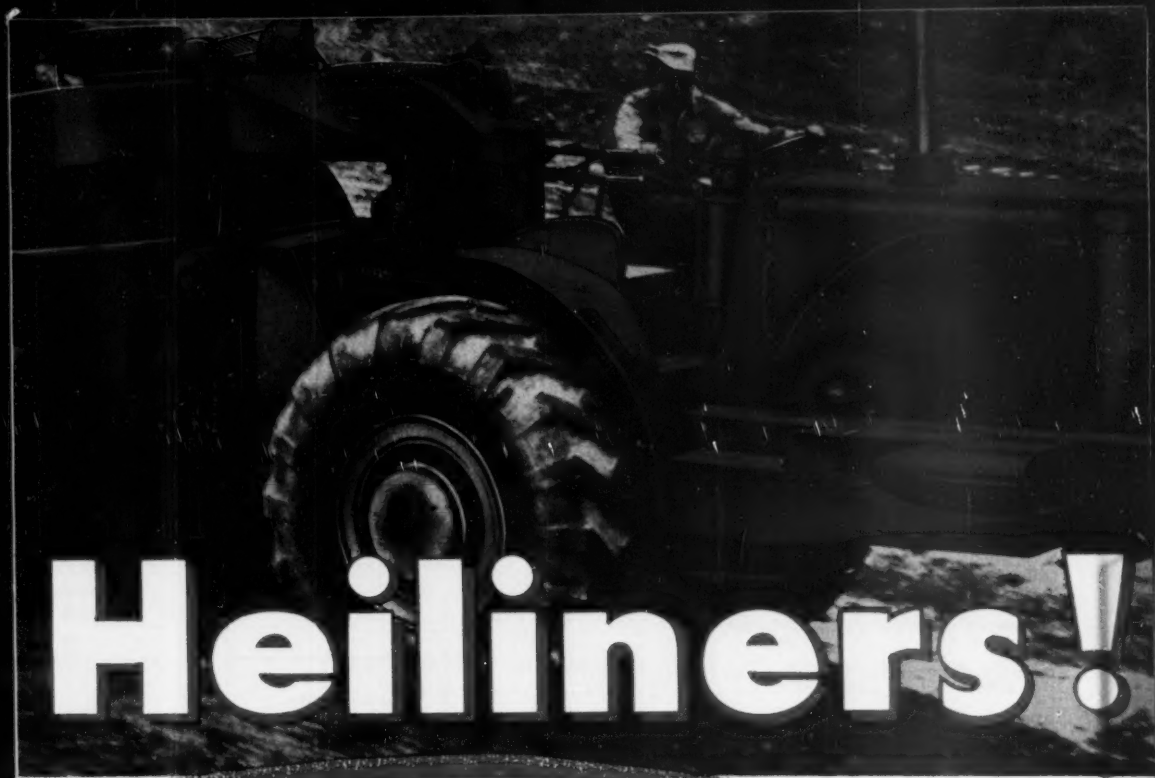

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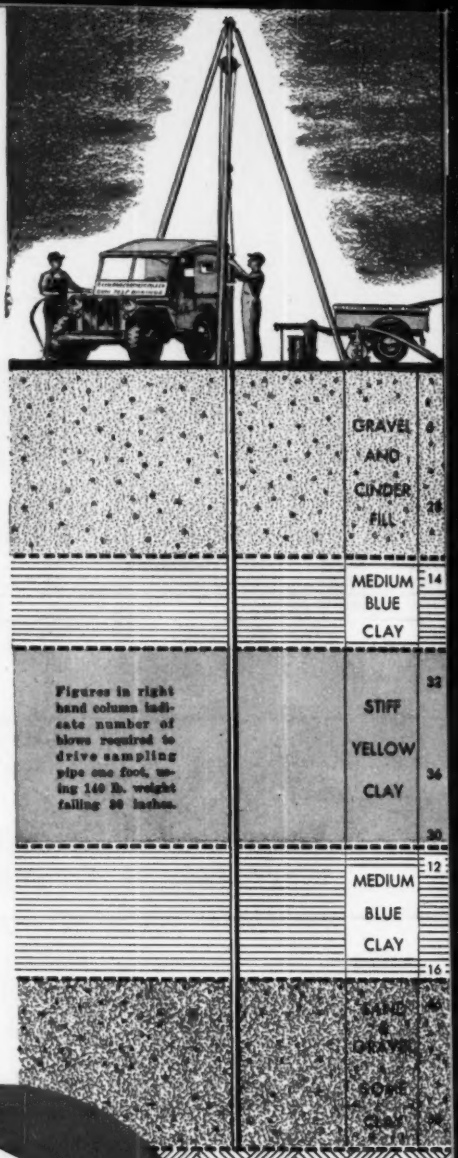

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THE CONSTRUCTION WEEK

HIGH COURT RULES FOR WEST VIRGINIA—The Supreme Court ruled unanimously this week (April 9) that West Virginia may take part in the eight-state Ohio River Pollution agreement despite a state court decision.

Seven states, the federal government and the interstate commission on the Potomac River Basin had asked the high court to reverse a ruling of the West Virginia Supreme Court. They said it imperiled the validity of all interstate compacts.

The trouble arose when the West Virginia auditor refused to release the state's appropriation for the Ohio River Valley Water Sanitation Commission. He claimed the West Virginia legislature had violated the state constitution by assuming this debt and by delegating its police power to an outside agency (ENR April 20, 1950, p. 27).

Speaking for the U. S. Supreme Court, Justice Felix Frankfurter found that the compact is not in conflict with the state constitution.

PERMISSIVE TREATMENT—Congress has before it a bill that would allow the District of Columbia to treat sewage from Virginia communities across the Potomac. The Virginians are trying to get together on an engineering study that might show economies for an under-river line to a central plant to treat sewage that now discharges raw into the Potomac.

NEW INTERIOR UNDERSECRETARY—After months of waiting, President Truman has nominated, as No. 2 man in the Interior Department, Richard D. Searles of Arizona. Searles is a rancher and president of the Salt River Valley Water Users and the Salt River Power District.

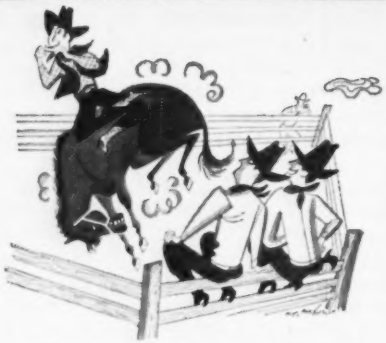
MILITARY CONSTRUCTION SWITCH—Military construction functions for the states of Montana and Idaho, and the area west of the Cascade Mountains in Washington and Oregon, have been assigned to the Walla Walla, Wash., district of the Corps of Engineers. Formerly, the Seattle district was responsible for all minitary construction in the Pacific Northwest.

INTERIOR CONTESTS ROANOKE RAPIDS DECISION—Secretary of the Interior Oscar L. Chapman notified the Federal Power Commission last week that he will seek a review by the U. S. Court of Appeals of FPC's decision licensing the Virginia Electric and Power Co. to develop the controversial Roanoke Rapids site (ENR Feb. 1, p. 17).

BOMB SHELTERS IN DEMAND—Los Angeles contractors and engineers report a fairly good business in the green pastures of A-bomb shelter construction. However, Los Angeles civil defense director, Adm. Robert W. Berry, declares that he will not build a shelter in his back yard. He says home shelters are too costly both in money and materials.

TRANSCONTINENTAL HIGHWAYS—That hardy perennial, a proposal for a system of cross-country toll roads, has bobbed up again in Congress. Senator Kilgore of West Virginia introduced a bill last week for a $12-billion "Transcontinental Streamlined Highway Corp. of the United States of America" to link East and West Coasts, the Great Lakes and the Gulf.

TRUCKERS ASK 50-MILE SPEED—Last week a group of Wisconsin truck operators appeared before a state senate highways committee and asked for a 50-mph speed limit. A proposed bill would limit them to 45 mph. The truckers contend that large trucks operate most efficiently between 42 and 48 mph. Wisconsin's highway department displayed charts showing a sharp increase in highway abuse from heavy trucks between 40 and 50 mph.



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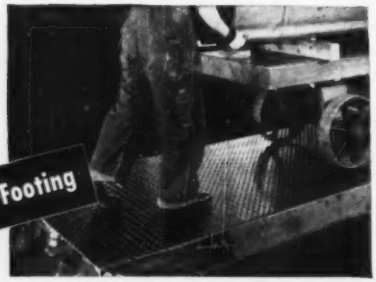

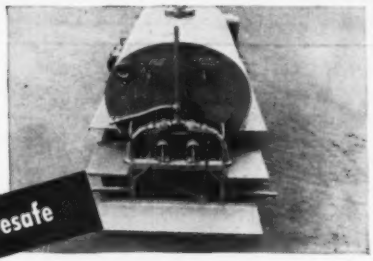

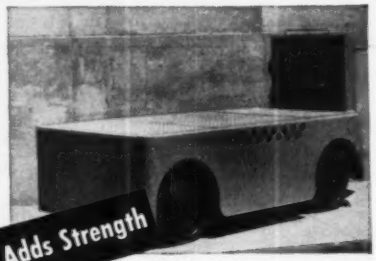

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CONSTRUCTION TRENDS

U. S. BUSINESS PLANS RECORD CONSTRUCTION OF NEW PLANTS

Record plans for expanding industry point to a big jump in industrial construction this year.

Manufacturing industries want to invest $13.3 billion in new plant and equipment in 1951. That's 66% more than they spent last year—and it's the biggest investment schedule ever laid out for one year.

Big emphasis is on increasing capacity—building new plants rather than modernizing old plants. If these plans go through to completion, productive capacity of U. S. manufacturing industries will increase 9% in one year.

The size of these investment plans—and their emphasis on expansion—means a continued high level of industrial construction through 1951.

These are highlights from McGraw-Hill's fourth Annual Survey of business plans for new plants.

DEFENSE RAISES INVESTMENT—This is part of a long wave of expansion—with an added boost from mobilization. Manufacturing industries have raised capacity 75% since 1939, 7% in the last year alone.

Mobilization influence shows clearly in comparing investment plans. Largest increases in spending are scheduled by industries producing war goods and basic materials. Non-ferrous metal industries want to invest 175% more than in 1950, transportation equipment makers 277% more—mostly in the aircraft industry. Electric machinery, steel, chemicals all plan large increases in capital spending.

Other industries will spend more, too—if they get the materials. Promise of a booming civilian market makes just about all industries interested in growing. But the big concentration is in war industries.

ACCENT ON EXPANSION—Emphasis in investment is shifting—from modernizing old plants to building new ones. For construction, that's the key fact about industry's investment plans.

Last year, manufacturing concerns used about 57% of their investment money to replace and modernize old equipment. This year the figure is down to 42%. The rest—58% of investment funds—will go into entirely new plant and equipment.

Pressure for further expansion comes from both business and government. Manufacturers hope to keep on using old plants for civilian production—so instead of converting old plants to defense work they build new ones. And Washington encourages expansion by offering accelerated amortization for plants essential to defense.

The Survey shows the results of these pressures: the most drastic shifts from spending for modernization to spending for expansion are in key defense industries.

Makers of transportation equipment plan to boost capacity 38% in 1951. Expansion will take 81% of their investment funds, compared to only 25% in 1950. Chemicals industries want to spend 80% of their capital funds for an 11% expansion. Plans of steel companies assign 67% of investment to expansion, compared to only 47% last year.

EXPANSION BOOSTS CONSTRUCTION—Widespread expansion means a continued high level of industrial construction.

A 9% expansion of manufacturing capacity calls for big increases in plant. The Survey shows that manufacturing concerns plan to spend 79% more for construction this year than they did in 1950.

Biggest increases in spending for construction are scheduled for industries expanding fastest—the steel, chemical and transportation equipment makers all plan to more than double construction expenditures.

Increases in manufacturers' plans for construction break down this way:

Industry	1950-1951
Chemicals	143%
Autos	78%
Food	31%
Petroleum refining	5
Machinery	83
Steel	121
Textiles	not available
Electric machinery	80
Transportation equipment	288
Other manufacturing	48
Total manufacturing	79

The Survey does not cover construction plans of non-manufacturing industries. But the overall level of planning for industrial construction is clearly very high—as ENGINEERING NEWS-RECORD's weekly figures on new industrial building contracts have demonstrated.

SHORTAGES MAY INTERFERE—Results of the McGraw-Hill Survey are not a forecast of what business investment will actually be.

A number of things can happen to alter plans for investment—make them either larger or smaller.

Inflation could cause a drop in actual spending. Prices of capital goods are up about 10% over a year ago. So are construction costs.

Shortages of materials may cut further into capital spending.

But, in spite of inflation or shortages, industry's investment in new plants and equipment is bound to be high this year—and that means industrial construction will stay high, too.

North Park School, Rapid City, South Dakota—Architect: Ewing & Forrette, Rapid City, South Dakota

Kaylo Insulating Roof Tile, with its combination of advantages, forms a better and longer-lasting roof deck—and a completed ceiling at the same time. The smooth under-surface of a Kaylo roof deck has a light reflection factor of approximately 80 per cent. The tile ceiling need not be painted.

Consider these additional advantages provided by Kaylo Insulating Roof Tile:

Incombustibility of Kaylo Tile protects against fire. The tile withstand building fire temperatures up to three hours and are still strong enough to be walked on.

Insulating Value eliminates the need for additional insulating materials under all but severe conditions. The tile provide insulating value equal to that of an inch and one-half of standard insulating board.

Structural Strength of Kaylo Insulating Roof Tile is more than adequate for typical roof loads.

Inorganic Composition of Kaylo Roof Tile, a calcium silicate (not glass), resists rot—moisture does not damage the tile.

Light Weight (only 5 lbs. per sq. ft.) permits the use of lighter, more economical supporting members and foundations. Kaylo Insulating Roof Tile provide simple fast construction of flat or pitched roofs. The tile are laid quickly and easily on steel sub-purlins or standard structural shapes, or may be nailed to wood joists. Standard roofing materials are used over a Kaylo roof deck.

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Manpower manhandled

THE NEW SELECTIVE SERVICE regulation—aimed to assure an uninterrupted flow of trained engineers and scientists—is a meat-axe solution to a scalpel problem.

Even disregarding the undemocratic idea of providing exemptions only for those lucky enough to go to college, the regulation misses the goal of conserving and training brilliant scientific minds. Such minds might be present in the great army of "average" students exempted, but they would be greatly outnumbered.

Without universal military training, there is no easy solution to the problem. But a better approach than the present one would seem to be to draft all able-bodied men of a given age, and then re-assign to schools those who have patently superior possibilities for serving their country with their minds instead of their hands.

Going to college under such a procedure would then be a military duty on a par with any other type of duty a military man is likely to draw.

Fluoridation takes a giant step

WHILE MANY HEALTH DEPARTMENTS across the nation have taken enthusiastically to water supply fluoridation, a goodly number of others have waited and watched. Now, New York State's Department of Health has chosen to wait no longer. It has called the 10-year Newburgh-Kingston test a success (ENR Apr. 5, p 29) although it is barely half over.

Tooth decay in Newburgh children, who have been drinking 1.1 to 1.4 ppm of sodium fluoride in their tap water since May, 1945, is now 33% less prevalent than in youngsters up-river where Kingston water is similar in quality but not enriched with fluorides.

The benefits thus are plainly available. And New York authorities have shown good judgment in their decision to reap those benefits, starting now rather than requiring five years more of similar test results. Any community in the state having fluoridation plans is invited to apply for permission to proceed. It's a big stride forward for fluoridation, and agencies, which have been watching Newburgh and Kingston from other states, may now make it even bigger.

State-wide soil facts

NEW JERSEY has begun publication of results of a state-wide soil survey whose purpose is worthy of careful consideration by each of the 48 states. This purpose is to inventory and catalog all the state's soils, county by county, to the end that engineers may quickly determine which soils to avoid, which are good and which are bad, but can be improved. Although undertaken with highways primarily in mind, the survey will provide data that will be equally valuable for all kinds of engineering structures both public and private.

New Jersey's survey is said to be the first of its kind or scope ever attempted on a state-wide basis. The idea of soil mapping for highway purposes was probably first initiated in Indiana just after the war when a joint project of the state highway department and Purdue University was set up. The New Jersey survey, sparked by Rutgers University, was begun in 1945 by Prof. Franklyn C. Rogers, of the college of engineering. Subsequently aid was enlisted from the state highway department, which had some research funds available from the U. S. Bureau of Public Roads. It may be also noted that the Bureau has a similar joint soil mapping project under way with the Maine highway department. Apparently funds are available for this useful type of study, which is another reason why more states should examine its possibilities. The first two New Jersey reports (planned to be 22 in number) may be obtained from the Rutgers Bureau of Engineering Research, New Brunswick, N. J. at a nominal cost.

Highway landscaping

NOT MANY YEARS AGO the only knowledge of landscaping methods that a highway engineer needed was how to grade slopes and grow grass to check erosion. Later, however, because of the use of this limited knowledge he came under frequent criticism for failure to protect trees that could have been saved at little expense, or for neglecting to specify minor grading-operation changes that would have fitted new highways into the landscape more harmoniously.

For the most part those days are past in most highway departments—under the pressing need for the use of the most advanced knowledge of landscaping methods and silviculture. Support for this conclusion is found in a recent announcement of the New Jersey State Highway Department that during 1950 the department planted 841 large trees and 3,000 smaller varieties of trees and shrubs in its roadside beautification work. Part of this planting was on the state's new parkway, but much of it was done on state highways as part of the regular program.

This situation points to the desirability of encouraging some men in each highway department to become familiar with the various types of trees and shrubs that are available for landscape work, especially the local ones. Study of the local trees and shrubs to determine which ones are best suited to highway work or which ones thrive best under various conditions can also become an interesting hobby.

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New double-duty Traffic Marker guides drivers by sound and sight both day and night

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ENGINEERING NEWS-RECORD

APRIL 12, 1951 VOL. 146 NO. 15

Senate group reports tight defense housing measure

FHA insurance authorizations limited to $1.5 billion community facilities restricted to $60,000,000; land purchases to $10,000,000 —President to pick areas

The Senate plans to vote this week on its version of the defense housing bill.

As reported by its Banking Committee, the Senate measure is a much tighter bill than the one the House rejected last month. Members of the Senate announced they would offer further tightening amendments on the floor.

With some revisions, Congress probably will pass a defense housing bill embodying the features of the Senate committee draft. The House turned back by a thumping majority a bill that closely followed administration lines. In the Senate committee, the bill was rewritten to apply exclusively to defense housing.

The House bill would have given the administration just about what it asked for:

(1) A $3-billion additional FHA insurance authority without any strings attached—to be distributed among the various housing programs wherever needed, including a new Title IX to be added to the National Housing Act;

(2) Title IX to give 90% mortgage insurance for defense rental housing, in any certified defense area where relaxed credit controls failed to produce the needed dwellings;

(3) Authority, subject to later appropriation, for the government to build defense housing where none of the special incentives persuaded private builders to act;

(4) Similar authority to assemble land in isolated defense areas for resale to builders; and

(5) The same kind of authority to make federal loans and grants for community facilities necessitated by defense housing.

• **Running out**—The administration called the bill a standby measure. That was correct so far as the Defense Housing Authority is concerned. But need for increased FHA insurance authorization is drawing closer. Nearly all FHA mortgages for new houses are made under Title II—sales, rental and co-op. Present Title II financing authority is likely to run out in six weeks to two months.

Defense housing aid in the bill might not be needed. Relaxed credit terms may produce the houses for defense workers, as they give promise of doing at Aiken and Paducah. The government is more likely to use the land buying and community facilities powers—both of them feared by the real estate people.

The Senate bill (reported by the Banking Committee) tightened the restrictions, in line with Chairman Burnet R. Maybank's ideas. The insurance authorization was earmarked exclusively for defense housing and was cut to $1.5-billion.

• **For critical areas**—Aids in the bill can be used until the President designates a locality as a "critical defense housing area." In a certified area, the government has to follow these steps:

(1) Relax credit terms;

(2) Offer use of Title IX to builders; and

(3) If builders don't apply in 60 days thereafter, construct federal housing, similar to the permanent housing under the Lanham Act of War II.

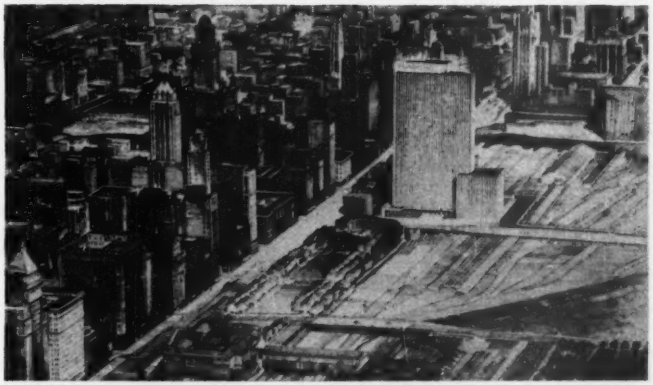
Authority for community facilities likewise is limited—to 60-million. The local government must first certify it cannot build the projects.

A limit is also set on authority for acquiring land—$10-million. The purpose of this authority is principally to prevent speculation.

Real estate spokesmen said the government housing, land buying and facilities authorizations were still so loose as to be dangerous. Builders wanted changes in some of the housing requirements in order to make them workable.

• **Douglas and Long**—Senators Russell B. Long of Louisiana and Paul H. Douglas of Illinois planned to offer amendments that would prevent builders from erecting rental projects without risking any of their own money, as some of them were able to do under the old war-emergency Section 608 that expired a year ago. Douglas also wanted to close the door on kickbacks by subcontractors, with money the builder could pocket at government expense.

After Senate passage, the bill was to be referred by the House to its Banking Committee.



INSURANCE OVER THE RAILS—The Prudential Insurance Co. has announced plans to erect this 35-story office building in Chicago. It will be built over the Illinois Central Railroad tracks and over a part of the Randolph Street suburban station at Michigan Ave., on the Lake Front. Polished granite will be used on the exterior, with window frames and spandrels of stainless steel. Main supports will be 400 caissons extending about 100 ft down to bedrock. Construction cost is estimated at $30 million. Naess & Murphy, Chicago architects, are drawing the plans.

Ohio, Colo. sites revealed for next AEC installations

A $30-million uranium ore refinery, and other facilities for the production of uranium feed materials, will be constructed on a 1,200-acre site near the Miami River, 19 miles northwest of Cincinnati, O., the Atomic Energy Commission announced last week.

The plant will produce uranium in forms suitable for use in AEC fissionable material production plants. No atomic weapons will be made there and no radiological hazards are expected.

The construction contract has been awarded to the George A. Fuller Co., New York, but final selection of the operating contractor has not been made. About 3,000 will be employed during the peak construction period and an operating force of 1,200 will be required.

AEC also revealed that a specialized research laboratory, to cost $1,800,000, will be built on a section of the National Bureau of Standards grounds, south of Boulder, Colo. Stearns-Rogers of Denver is the architect-engineer for the project.

When completed, the laboratory will be operated by the National Bureau of Standards. The nature of the Boulder operations have not been disclosed, for security reasons.

Indict union, employers on anti-trust charge

Ralph Howard Alsup, business agent of the United Association of Plumbers and Pipefitters, local 525, and two Nevada trade associations—the Las Vegas Merchant Plumbers Association and the Merchant Plumbers Exchange, Inc., and seven Las Vegas plumbing contractors—are charged with violation of federal anti-trust laws in an indictment handed down last week.

A Federal grand jury in Las Vegas charged the defendants with conspiracy to suppress and eliminate competition in the sale and distribution of plumbing and heating supplies in southern Nevada. Conviction on the charge is misdemeanor would bring a maximum fine of $5,000 or a prison sentence of one year, or both.

Alsup is charged by the grand jury with having agreed with the contractors to prevent union members from working with contractors who were not parties to the arrangement.

The contractors are alleged to have used a common estimator through their associations, and to have allowed a committee to select the contractor who would be low bidder, while others submitted merely complementary bids.

STEAMED THEM UP—*Locomotive silhouette is one of four basic types of European road signs tried out on a test course along an Ohio highway—in a test for the United Nations. Citizens complained loud and long (said they thought UN had more important things to do); and the test was terminated abruptly. Sign with two slanting lines warning of a narrowing road ahead was judged best, may be adopted here. U. S. signs being tried out abroad brought no protests. (Wide World photo)*

NPA construction control reports 128 applications

Applications for new commercial buildings continued to get reasonably favorable action from the Washington office of NPA's Construction Controls Division last month. This office handles all applications involving more than $1,000,000 or 50 tons of steel, in addition to local jobs in the Washington metropolitan area.

Figures recently compiled show that in the two weeks of March 18-23, the Washington staff acted on 128 applications with a total estimated cost of nearly $59 million. The Construction Controls Division granted 90 of the requests, costing $28 million, and denied 38, totaling $31 million.

Navy plans air base work

Although some details are being withheld for defense reasons, U. S. Navy officials announce plans to build an 8,000-foot runway at its master jet base in Brunswick, Me.

Site planned for the base: an oil pipe line for Portland's Long Island running underwater and overland to the airport.

Merritt-Chapman elects Scott honorary chairman

Thomas A. Scott, chairman of the board and secretary of Merritt-Chapman & Scott Corp., last week asked to be relieved of his duties as an officer of the company. Scott, 73, has completed 53 years of continuous service in the present firm and the earlier T. A. Scott Co.

The announcement was made near the close of the annual stockholders' meeting where it was also voted to approve an increase in the authorized capital stock of the company from 500,000 no par value common shares to 1,000,000 common shares of $12.50 par each.

It was noted that the company currently has on the books construction totaling approximately $73 million, of which $15 million represents contracts secured in the first three months of 1951.

At a subsequent meeting of directors, Chairman Scott was made honorary chairman and Louis E. Wolfson, a major stockholder, was elected chairman.

Raymond V. Kopp continues as president and treasurer of M-C&S and Ralph E. DeSimone is executive vice-president and general manager.

F. E. Turneaure dies, engineer and educator

Frederick E. Turneaure, 84, dean emeritus of the University of Wisconsin's college of engineering, died at Madison, Wis., March 31.

Before his retirement in 1937, Prof. Turneaure had headed the engineering college for 35 years. He was graduated from Cornell University in 1889, and he taught for two years at Washington University at St. Louis before going to Madison. He was an authority on the theory of structures, the theory and practice of reinforced concrete, and in the field of water supply. He had received the Turner gold medal of the American Concrete Institute for his work in reinforced concrete design and he had been chairman of the committee on research of the ASCE at one time.

Ohio Senate shelves belt conveyor bill indefinitely

The powerful rules committee of the Ohio State Senate voted to "postpone indefinitely" action on the measure which would authorize construction of the controversial belt conveyor from Lake Erie to the Ohio River (ENR March 22, p. 9). The bill probably will not be reported out. If so, it may die in pigeon hole.

Two pipelines to cost $57 million

Natural gas will be brought to additional areas of Utah, Texas, Louisiana and Mississippi, under two plans providing for 1,400 miles of pipelines.

Utah's Public Service Commission has granted authorization to the Utah Natural Gas Co. for its planned 400-mi, $32-million gas pipeline from southeastern Utah to the Salt Lake valley. However, the Commission ruled Utah Natural Gas must file "the unconditional commitment of a recognized financial house stating it will supply funds for construction of the pipeline."

Geological proof of adequate gas reserves and construction contracts with pipeline building firms must also be proffered under the Commission grant.

The line, of 18-in. maximum dia with an 8-in. feeder, would run to Salt Lake City from the Boundary Buttes region, and would be planned to bring 76,000,000 cu ft of gas daily to industrial consumers.

It is believed that, if southeastern Utah gas deposits "prove up" and are tapped by the planned line, such heavy industrial users as the area's copper refiners, metals smelters and steel-makers would no longer be in fear of a mid-winter shut-off. In several past winters, plant needs could not be met since home-heating, school and hospital needs were necessarily given prior consideration in periods of extreme low temperatures.

The United Gas Pipe Line Co. has awarded a $25 million contract to Gulf Southern Contractors, of Fort Worth, for construction of about 1,000 miles of natural gas line.

All of the construction work will be within Texas, Louisiana and Mississippi, the pipeline company reported. Award of the construction contract follows the letting of a contract to Brown and Root, Inc., Houston, covering various phases of engineering, construction and other services.

NRA board meets in Utah to hear two reports

Two reports commanded the attention of the Board of Directors of the National Reclamation Association in its three-day session at Salt Lake City.

Word from Harry E. Polk of Williston, N. D., association president, assured the group that $300 million will be spent on reclamation projects in the west despite the international crisis.

At the same time W. G. Sloan, coauthor of the Pick-Sloan Missouri Basin Plan, as well as Judge George T. Cochran of Oregon and Guy C. Jackson reported upon the three-volume study of the President's Water Resources Committee.

Polk asserted that there is no truth in widespread reports that the government will stop reclamation projects.

Primary attention of the NRA board was devoted to the committee reporting on the national Water Resources Report. The official report of a study was not released to the public.

Support for a bill in Congress intended to permit federal aid on projects too small to come under supervision of the federal Bureau of Reclamation was voted.

30-ton impeller placed for giant Coulee pump

The key piece—a 60,000-lb, seven-vane impeller—in what is said to be the world's largest pump has been placed by Bureau of Reclamation workmen at the Grand Coulee Dam, preparatory to first tests scheduled for early May.

The huge impeller will force water up 280 ft from the lake behind the dam and over the rim of the Columbia River canyon, for the Columbia Basin irrigation project 60 miles away.

Lowered into position with the impeller was a 17-ft shaft which will connect the pump and its 65,000-hp motor. Fourteen bolts, each weighing 76 lbs, connect shaft and impeller. The pump is embedded in concrete directly below the motor.

It will push 720,000 gpm out of the river at an impeller perimeter speed of almost 100 mph. The second pump is due for completion a few weeks after the first.

Armed forces seek extra 1951 construction cash

Last week's Third Supplemental request to Congress for Defense Department money asked for less than $500 million of construction cash. Major military construction programs will come up later in the regular appropriation request for fiscal 1952. The Defense Department will submit its 1952 figures to the Budget Bureau about the end of this month, and they will go to Congress in May or June.

Air Force construction accounted for most of the military public works money requested last week. The Air Force asked $300 million for "acquisition and construction of real estate." That request implies mainly airfields, airbases and supporting construction. The Navy requested $137 million for construction of ships and $17.5 million for new public works.

In the Army list, the only item relating to construction was $400 million for expediting production. Some of this money will be used for plant expansion and rehabilitation.

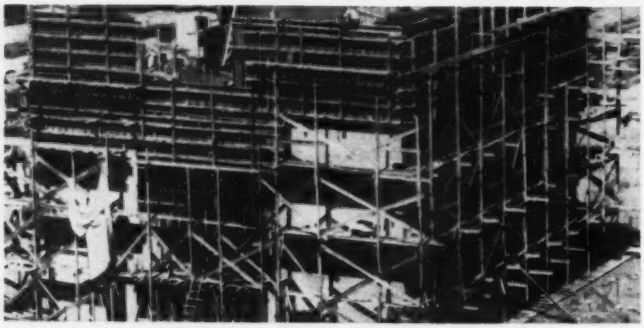
Construction cash requested last week is principally to maintain progress on work already initiated. No new programs are involved. Major outlays for new construction works will be covered in the request for fiscal 1952, starting July 1.

New Lewis River Dam preliminary work begun

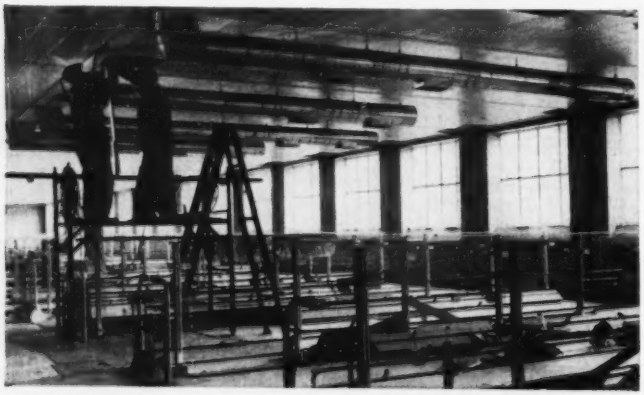
Preliminary construction has begun on a 26,000,000 hydroelectric dam on the upper Lewis river 30 miles east of Woodland, Wash., for the Pacific Power & Light Co. of Portland, Ore. Morrison-Knudsen Co. of Boise, Ida., has the contract.

PROPOSED MIAMI AIR TERMINAL—Architect's drawing of terminal to be built at Miami International at a cost of about $3 million—part of a $13-million expansion program. Designers Steward & Skinner, working with the Civil Aeronautics Authority, have incorporated every idea possible to move passengers, baggage and planes efficiently. Construction contract has not been let.

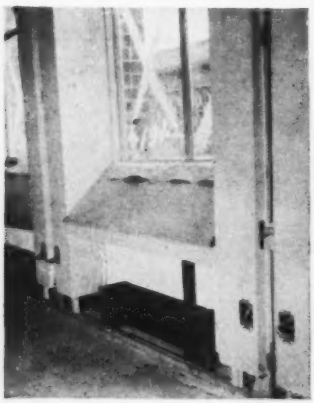
Atomic lab building brings construction surprises



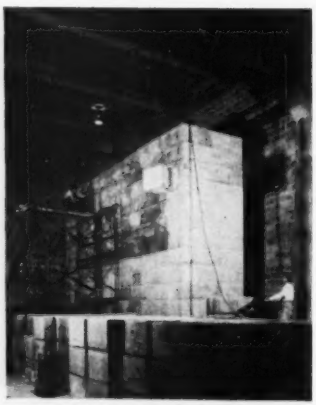
THE GREAT WALL—The cyclotron vault requires walls 7 ft thick. Concrete has to be placed by the alternate-block method, as in large dams, to minimize shrinkage.



SMOOTH SURFACES—Stainless steel ducts, metal walls and ceilings and vinyl plastic flooring will assure that radioactive particles do not rest undetected. Partitions will enclose the piping.



SLOPING WINDOW SILLS leave little opportunity for dust to collect. They also serve as part of the enclosure for the convector panels and the electric wiring.



PRECISION-MADE CONCRETE BLOCKS are assembled into nuclear research cells. Keyways blocks for 3-in. square steel cores fix vertical alignment.

New and strange types of construction are required to provide the facilities needed for atomic research. This becomes clear from the first pictures that the Atomic Energy Commission has permitted to be released on the Argonne National Laboratory being built by The Austin Co., Cleveland, to designs by Voorhees, Walker, Foley & Smith of New York.

Argonne, the successor to the University of Chicago setup, where the first controlled self-sustaining nuclear chain reaction took place, is now getting along in its old quarters, plus a garage and an abandoned brewery.

The new plant on a 3,600-acre site 25 miles southwest of Chicago will change all this to the best that modern knowledge of atomic lab needs can provide.

Argonne is one of three labs that the AEC has established, the other two being at Oak Ridge, Tenn., and Patchogue, Long Island. All three labs work with participating university research staffs in their regions. There are 31 such universities on the Argonne roster.

FSA begets OMR

Oscar R. Ewing, Federal Security Administrator, has announced the Office of Materials Requirements under the immediate direction of Assistant Administrator for Defense Activities, Rufus E. Miles Jr.

Various branches of the agency will estimate and justify materials requirements in their fields.

The new office will be staffed by a special detail of FSA personnel. It will act as claimant for FSA in its function as a claimant in these fields under the Defense Production Administrator.

The office will deal with the Defense Production Administration in matters treating school and hospital, especially veterans' hospital jobs.

Did iodide bring snow?

A deluge of early spring snow has piled up on three major Colorado watersheds where silver iodide generators of the Water Resources Development Corp. have been in action this winter. The snowpack in the three areas (the headwaters of the Colorado, South Platte and Arkansas Rivers) is now 20 to 50 percent above normal.

The professional rainmakers claim credit for this. They point to subnormal snowfall so far this year in mountain areas where they have not been operating, and the drought of last fall to reinforce their claims.

CONSTRUCTION BUSINESS

Watch reaction to bargaining election

Top point of interest for construction businessmen last week continued to be labor's reaction to the decision of the National Labor Relations Board to hold bargaining representation elections at Baltimore, Md., and Olean, N. Y. (ENR April 5, p. 24).

NLRB decided to hold the elections (but didn't set a date) despite the strong opposition of the powerful Building Trades Department of the American Federation of Labor. Locals of the plumbers' union had demanded elections.

• **Repercussions**—Repercussions of the decision could be wide and carry heavy burdens for the construction industry. AFL leaders went so far—unofficially at least—as to predict that strikes may be called in protest against the NLRB move.

The labor leaders see in the plumbers' demand a move to enlarge that particular union's jurisdiction by including closely-related work (to that of plumbers, pipe-fitters, apprentices) now being done by other unions, or now in dispute.

One result, these leaders said, might be disruption of unofficial—but time-tested—working agreements that have held sections of the construction labor field in line for many years. It might also upset delicately-balanced jurisdictional questions.

• **Elections difficult**—Another upsetting factor—business-wise—would be the setting up of procedure for such an election. NLRB's former general counsel, Robert Denham, abandoned the attempt as too difficult, after an abortive trial in Pennsylvania several years ago. Denham found that it was nearly impossible first, to find the construction workers at any given time, and second to determine for whom they worked and who, therefore, should sign contracts with them.

NLRB itself never has exercised the jurisdiction granted to it by the Taft-Hartley Law to the full, though it has entered the picture from time to time by virtue of the law's requirements that ban jurisdictional disputes and boycotts.

Labor men also see another danger in the elections: A means by which insurgent small groups could upset current area-wide agreements by demanding such bargaining votes, then making their own deals with employers without regard to overall building trades compacts.

Business briefs . . .

• **Housing costs**—Construction cost of a standard small house increased 9.7% during 1950, said the National Association of Real Estate Boards. NAREB surveyed real estate men and builders in 110 U. S. cities on the cost of a one-story, frame house.

• **Lumber orders up**—Shipments and new orders for lumber continued to run higher than production, according to the National Lumber Manufacturers' Association. In the week ending March 24, shipments were 17.7% above the production of 445 mills, new orders were 2.3% above production.

• **Spending for steel**—Steel companies of the nation spent the equivalent of $24.50 per capita for the entire U. S. population during the years 1946-51, for capital improvement and expansion. The total came to about $4.8 billion. And this year, said the American Iron and Steel Institute, the steelmakers will spend another $1.2 billion.

• **Doing business**—A new booklet, called "Handbook of Emergency Defense Activities," available from the Office of the Superintendent of Documents, Washington, D. C., lists names, addresses and telephone numbers of principal officials and informational personnel of defense agencies.

• **Boom confirmed**—Despite materials shortages and tighter credit controls, U. S. construction work is setting new records, according to the Commerce and Labor departments. A joint summary for the first quarter put new building activity at $6.1 billion—biggest ever.

• **Imports bolster iron**—Nearly 9.2 million net tons of iron ore came into the U. S. last year from 15 foreign countries—the largest amount of this ore ever imported, according to AISI. The figure exceeded the record for 1949 by nearly a million tons. Largest foreign suppliers were Chile, Sweden and Canada-Newfoundland.

• **Plywood production up**—Production of softwood plywood rose for the month of January to 260,708,000 sq ft, as compared to 233,634,000 sq ft (⅜-in. equivalent) for December, 1950, according to the Department of Commerce. Shipments for January were also up, but remained below production rates. For January, shipments and consumption totalled 248,358,000 sq ft, leaving stocks at 58,783,000 sq ft at month's end.

• **Steel production high**—Although representing a drop under the previous week of 1.1%, steel producers report that in the week beginning April 2 they produced at the rate of 102.4% of capacity—equivalent to 2,047,000 tons of ingots and casting for the whole industry for the week. Previous week percentage was 103.5% of capacity.

NPA to standardize building hardware

The National Production Authority's first broad order standardizing a line of products is scheduled to fall—and soon—on the building hardware industry.

As presently drawn up, the order standardizes locks, knobs, hinges and other hardware. It provides tolerances for sizes and limits materials to be used.

Some members of a hardware industry advisory committee fought hard against the order, arguing that regulation would make it impossible to meet current demands. NPA officials replied that restrictions will soon cut the number of housing starts—and thus cut into demand.

• **Not alone**—Hardware makers are not alone in their problems of meeting current demand. Makers of water meters told NPA that new construction has outstripped the manufacture of meters by four to seven months. The manufacturers blamed the 1950 base period (a time of low production) set by NPA.

• **Other regulations coming**—Meanwhile, mobilizers are proceeding with plans for controls on other construction materials. Among these are:

Asbestos—Controls seem likely, since the U. S. depends almost entirely on imports from Africa and Canada.

Steel—Manufacturers of furniture, fixtures, utensils, cutlery, household appliances, autos, games, etc., can use only 80% as much iron and steel in the second quarter of 1951 as they used in the average quarter of the first six months of 1950.

BIDS AND BIDDERS

(Major project news received after Construction Reports, page 84, went to press.)

Atomic Reactor—National Research Council, Ottawa, Ont., has selected C. D. Howe Co., Ltd., Hamilton, Ont., as engineer for $30,000,000 atomic reactor at Atomic Energy Plant, Chalk River, Ont.

Furnace and Coke Ovens—Brazilian National Steel Co., Volta Redonda, Brazil, awarded contract to design and construct blast furnace and chemical coke ovens, at Volta Redonda Plant to Koppers Company, Pittsburgh, Pa.

Apartments—Broadmoor Apartments, Jackson Heights, N. Y., will construct nineteen six-story apartment buildings at Jackson Heights, N. Y. Kavy & Kavovitt, Brooklyn, are architects.

Sugar Beet Refinery—Ottawa Valley Sugar Refinery, Plantagenet, Ont., plans a $4,000,000 sugar beet refinery.

Apartments—Lewis Construction Co., Seattle, Wash., plans to build eight apartment buildings in Anchorage, Alaska, to cost about $3,000,000.

Academic Buildings—Department of the Navy plans altering academic buildings, mess hall and Bancroft Hall, at U. S. Naval Academy, Annapolis, Md. Estimated cost is $3,000,000. Hall, Border & Donaldson, Baltimore, Md., are architects.

Plant—Anaconda American Brass, Ltd., Toronto, Ont., plans expanding tube mill and new copper department at New Toronto, Ont. Estimated cost will be about $4,000,000.

Hospital—James McHugh Construction Co., Chicago, Ill., has been awarded a $2,220,032 general contract for hospital addition, at Dayton, O., for St. Elizabeth's Hospital. Total cost of project is $4,000,000. Schmidt, Garden & Erikson, Chicago, are architects.

Apartment—Howard Apartments, Forest Hills, N. Y., will construct by own forces a $4,000,000 apartment in Forest Hills. Philip Burnham, New York, N. Y. is architect.

Aviation Gasoline Plant—Eastern States Petroleum Co., Inc., Houston, Tex., plans a $2,750,000 aviation gasoline plant.

Road—Bureau of Reclamation, Hungry Horse, Mont., received a low bid for 47 miles Forest Service Road at Hungry Horse Reservoir, Montana, from S. Birch & Sons and McLaughlin, Inc., both Great Falls, and F & S Contracting Co., Butte, at $2,348,213. Bids were opened April 3.

Pipe Line—Bechtel Corp., San Francisco, Calif., has been awarded a $2,000,000 contract by General Petroleum Corp., Los Angeles, to salvage and relay pipe line for crude oil near San Ardo, Calif.

Los Angeles River Improvement—Peter Iewit Sons, Arcadia, Calif., have been awarded contract for Los Angeles River improvement by the U. S. Engineers, Los Angeles at $2,219,922.

Housing—M. Spinelli & Sons Co., Inc., Boston, Mass., will construct the $2,966,940 Rindge Avenue Housing Project for the City of Cambridge, Mass. Edward Sears Read & Associates, Boston, are architects.

Sewage Treatment Plant—City of Dallas, Tex., received low bid from Cullum & Whittle Construction Co., Dallas, at $2,699,437 when bids were opened April 3. Powell & Powell, Dallas, are consulting engineers.

Dwellings—L. de G. Belley, Chicoutini, Que., will construct 300 dwellings at Riviere du Moulin, Que., by own forces. Estimated cost is $2,500,000.

School—Wadhams & May Co., Hartford, Conn., has been awarded a $1,371,700 contract to build school in West Hartford by the Town Board of Education, West Hartford, Conn.

Warehouses—General Services Administration, Washington, D. C., awarded contract for warehouses at Wardwell Yards, Cincinnati, O., to Montgomery Construction Co., Grove City, Pa., at $1,895,000.

Power Plant—Bids will be opened May 7, by the City of Brownsville, Tex., for a power plant to cost about $2,000,000. Black & Veatch, Kansas City, Mo., are consulting engineers.

Printing Plant—California State Division of Architecture, Sacramento, Calif., plans a $2,780,000 printing building at Sacramento. Wurster, Bernadi & Emmons, San Francisco, and Albert W. Kahl, San Mateo, are architects.

Housing—New York City Housing Authority, New York, N. Y., plans to construct the Van Dyke Homes in Brooklyn Boro. Cost will be about $14,530,000. Kelly & Gruzen, New York, N. Y., have been selected as architects.

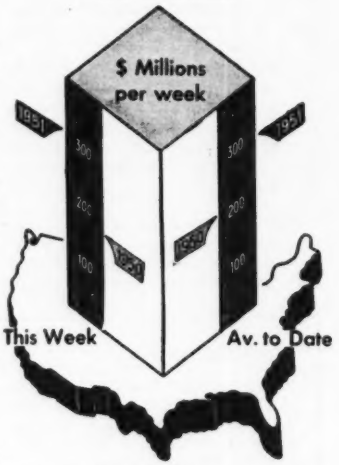
COSTS AND VOLUME

ENR INDEX NUMBERS

Index Base = 100		1913	1926	1949
Constr. Cost.	Apr. '51	538.69	258.95	112.93
Bldg. Cost...	Apr. '51	398.78	215.57	113.36
Volume	Mar. '51	558	227	161

Activity This Week

As reported to ENR (in millions of dollars)



Amount of contracts let

Week of Apr. 12 '51	This Week	Cumulative 15 wks 1951	1950	% chge
Federal	$53.4	$616.9	$451.9	+37
State & Mun.	69.6	1,045.1	840.0	+24
Total Public.	$123.0	$1,662.0	$1,291.9	+29
Total Private	188.2	2,830.3	1,733.4	+63
U. S. Total.	$311.2	$4,492.3	$3,025.3	+48

Contracts by type of work

	This Week	Cumulative 15 wks 1951	1950	% chge
Waterworks .	$2.5	$68.7	$75.0	−8
Sewerage ...	6.2	93.6	66.2	+41
Bridges	2.4	80.1	86.9	−8
Highways ...	16.4	274.2	273.8	+0.1
Earthwork, Waterways .	15.7	102.7	117.8	−13
Buildings:				
Public	58.9	720.3	515.2	+40
Housg., pub.	6.0	176.8	52.7	+235
Housg., priv.	35.1	566.7	1,030.3	−45
Commercial .	6.9	198.8	253.1	−21
Industrial ..	114.6	1,706.4	313.0	+445
Unclassified .	46.5	504.0	241.3	+109

NOTE: Minimum size projects included are: Waterworks and waterway projects, $34,000; other public works, $60,000; industrial buildings, $82,000; other buildings, $300,000.

New capital for construction

	Cumulative 15 wks 1951	1950	% chge
Corporate Securities	$550.5	$561.6	−2
Fed. loans, Priv. Constr	0	0	0
State and Mun.:			
Excl. housing ...	621.1	532.3	+17
Housing	255.6	190.7	+34
Fed. Aid, non-fed. constr.	73.4	0	0
Total Non-Federal..	$1,500.6	$1,284.6	+17
FEDERAL	2,602.5	0	0
Total Capital	$4,103.1	$1,284.6	+219

Northwest Army building to reach $65 million

Military construction work totaling an estimated $65,000,000 is being rushed by the Corps of Engineers in the Pacific Northwest.

Most of the work is located in Washington, although large Army Air Force projects in Montana and Idaho are also included in the program. Only one large job in Oregon, Beaver Ammunition Depot near Clatskanie, is included.

In the State of Washington, the present program includes the following projects for the department; $9,000,000 at Fort Lewis; Yakima Training Center, projects totaling $5,800,000 on which contracts have been awarded for $1,700,000; Auburn General Depot, $1,000,000; Mount Ranier Ordnance Depot, $2,960,000.

North Richland, rehabilitation of barracks and construction of new facilities for army camps, totaling $6,500,000, of which approximately $3,900,000 is under contract; McChord Field, totaling $2,600,000, of which $600,000 is under contract; Larson Air Force Base (Moses Lake), $7,380,000; Fairchild Air Force Base (Spokane), $8,570,000 including new runway; Paine Air Force Base (Everett), $1,750,000.

At Great Falls Air Force Base, Great Falls, Montana, proposed work includes new runway, barracks, 400 units of housing, and fueling facilities, $11,060,000.

At Mountain Home Air Force Base, Mountain Home, Idaho, proposed construction includes rehabilitation of buildings and utilities estimated to cost $1,000,000.

New GE labs planned

Seven new structures are planned to centralize the laboratories of General Electric Co., at Hanford, Washington. At present operations are spread apart some 30 miles distant and housed in frame buildings. The new move is designed to increase the efficiency of operations at the giant plutonium factory GE operates for the Atomic Energy Commission.

There are four key structures. Design of the largest building (for radio chemistry) is being readied by Leland S. Rosener of San Francisco. The firm also will design a radiometallurgy unit.

Preliminary plans for a pile technology building are being drawn up by C. T. Main, Inc., of Boston Mass. Already a Health Instruments Control and Development building is under construction by the Sound Construction and Engineering Co. of Seattle. This will be the largest job.

RETIRED—R. E. McDonnell, co-founder and president of the Burns & McDonnell Engineering Co., Kansas City, retired last week after 53 years of service to his company. He became a consultant to the firm. Seven experienced partners and a technical staff of about 100 carry on the business.

R. E. Dougherty consultant for N. Y. engineering firm

Richard E. Dougherty, former vice-president of the New York Central Railroad Co., and former president of the American Society of Civil Engineers, (1948) who latterly has been advisory consultant to the New York Central System, has left the Central and will act as consultant for the well-known firm of Seelye, Stevenson, Value & Knecht at 101 Park Ave., New York City.

Mr. Dougherty will continue as a member of the Commission on Renovation of the White House, and as consulting engineer for the trustee of the Long Island Railroad.

United Aircraft plans new plant expansion

United Aircraft of Hartford, Conn. plans three new plants to cost more than $20 million.

Two plants, one at Windsor Locks and the other at North Haven, Conn. will each have 500,000 sq ft of floor space each, be of reinforced concrete and steel girder construction and each cost $10,000.

The other plant will be in Montreal, Canada, for subsidiary Pratt & Whitney Aircraft, Ltd.

The Connecticut plants are designed by Albert Kahn, Associated Architects and Engineers.

Revised building code asked for Ohio schools

Lower, cheaper classroom ceilings for Ohio school buildings have been allowed by the Ohio State Board of Building Standards.

The new ruling followed agitation by a series of newspaper articles charging that 5% of the cost of school construction was due to Ohio's building regulations.

The new ruling will permit a 10-ft classroom ceiling instead of the previously required 12-ft height.

Meanwhile complete revision of Ohio's 40-year-old school building code is being pushed by Rep. James J. McGettrick, Cleveland, who is sponsoring a bill which he claims will save Ohio taxpayers $20,000,000.

Similar legislation is being prepared by the Ohio Program Commission, but will not be ready until 1953.

According to Dr. Arthur J. Klein, secretary of the Ohio Citizen's Commission for Public Schools, outmoded school building requirements threaten to waste millions of the $90,000,000 in school bond issues approved by Ohioans last November.

The appeal of the Cleveland Board of Education was granted by the State Board of Building Standards under its authority to approve "equivalent" materials. Lower ceilings can be built provided enough glass block or clear glass windows are set in the walls to allow the same amount of light into the room as would enter it if the ceilings were 12 ft high.

Road to iron ore planned

Three road projects planned for the province of Quebec are believed due for an early start.

One of these projects will push through rugged country to Seven Islands, railhead and shipping port for the new Quebec-Labrador iron ore. This will be an extension of the coastal road which now runs easterly from Tadousac at the mouth of the Saguenay River as far as Baie Comeau.

Another road to be part of this project will link with Havre St. Pierre, main pioneer settlement of the north shore of the Gulf of St. Lawrence.

Second project would cross Gaspe Peninsula from St. Anne des Monts a full 60 miles to New Richmond on the Baie des Chaleurs.

Third project, the $6,000,000 link of the Montreal by-pass, will be 13 miles of highway running from Ville St. Laurent to Pointe aux Trembles. When completed it will make possible through road traffic on a divided land highway from one end of the island of Montreal to the other.

Waterworks group ponders safeguards

Lack of legislative authority and limited manpower and funds are impeding the proper planning of civil defense measures for water plants and water supply in many municipalities.

This critical situation was emphasized at the 41st annual convention of the Illinois section, American Water Works Association, in Chicago.

What can and must be done to protect waterworks from the threat of ABC (Atomic, Biological and Chemical damage, either from an overt action of enemy forces or from sabotage, was crystallized in a roundtable discussion of civil defense by representatives of Indiana, Wisconsin, Iowa and Illinois.

• **Indiana's plan**—Indiana's civil defense plan—one of the few empowered with effective legislative authority—was described briefly by B. A. Poole, chief engineer, Indiana State Board of Health (Illinois has similar legislation now pending.

By legislative authority, Indiana has created a Department of Civil Defense, providing a state director and a small staff. Provisions are also made for the establishment of a department of civil defense in each county. The program is set up for interstate participation with neighboring states. But this will be permissible only where Indiana has a joint-compact for such action with the states in question.

• **Protecting water**—Other members of the panel suggested several safeguards for the protection of water supply from enemy action. Maps showing accurate locations of control valves and other other operating facilities of a distribution system should be prepared. The originals should be stored in fireproof vaults, and copies made available to all operating crews. Valves should be tested periodically to see if they are workable, and workmen trained to operate them.

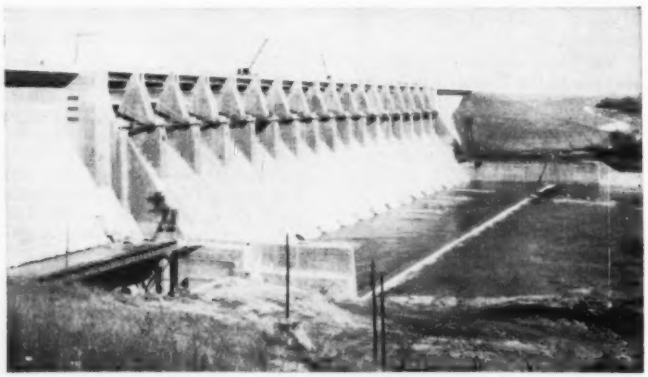
Auxiliary water storage and emergency supplies such as wells should be located and inventories as the capacity. Materials and equipment for emergency treatment and repairs should be inventoried and stockpiled in dispersed areas away from vulnerable targets.

Individual plant-inventories should be made of the quantity of water used for industrial purposes, to aid in maintaining water pressure during an emergency by shutting off the larger and less-essential users.

Distribution systems of treated water should have emergency access to large supplies of raw water to maintain pressure for fire fighting in the event of an extreme emergency resulting from an atomic explosion, or major sabotage.

• **Plant Protection**—Protective security of plants and pumping stations should be increased. Employees should be screened as to their loyalty, investigated when deemed advisable, and fingerprinted. Employees should be cautioned against discussing details of the water system, or locations of control valves and other operating facilities. Unauthorized persons should not be admitted to vulnerable parts of plants, while doors, windows and manholes to galleries should be locked or sealed.

Emergency and repair crews should have their own short-wave communications system; not depend on telephone service which might well be put out of commission during an emergency. And volunteer emergency repair crews should be recruited within the waterworks department, where possible. They could be trained more easily and probably would function more efficiently during an emergency than volunteers from outside the department.



ATHWART THE BRAZOS—Newly-completed $41-million Whitney Dam on the Brazos River near Waco, Tex., was built for the U. S. Engineers. (ENR Dec. 15, 1949, p. 28) Roadway across top is open to the public. Dam is 19,600 ft long and 167 ft high; the lake forming behind it will have a 190-mile shoreline. Dam was constructed for flood control, water conservation and generation of hydro-electric power. Work on the powerhouse will begin shortly, with Russ Mitchell, Inc., and Bruce Construction Co., Houston, the lowest bidders at $2,198,313. The dam was built by L. P. Reed Construction Co., Meridian, Texas.

Compromise plan permits start of coast sanitation

Two years of squabbling among seven sanitation districts in Orange County, Calif., ended recently with a compromise plan which will allow work to begin on additional sanitation facilities and the purchase for $1,282,753 of the existing outfall sewer system, including a 3,350-ft ocean outfall, sewage treatment plant and a booster plant.

Altogether, $8,308,000 in bond issue revenues are available for the joint project. Santa Ana, Orange, Anaheim and Fullerton districts and four adjacent sanitary districts are now joined by the agreement with virtually all the remaining areas of Orange County.

A steering committee of district chairmen is credited with resolving the prolonged debate.

Loan to N. J. agency spurs Raritan River clean-up

The Housing and Home Finance Agency has given its approval to an interest-free advance of $100,000 to New Jersey's Middlesex County Sewerage Authority for planning of a $29,700,000 project to clean up Raritan River pollution.

The Raritan is estimated to a have a 1,000,000-population-equivalent sewage load, though there are but 350,000 persons in its heavily industrialized lower valley. Its waters are used for domestic and industrial supply.

Money advanced for planning qualifies under the second advance planning program of HHFA's Community Facilities Service as being spent for defense or essential civilian needs.

Work contemplated is based on a 1947 report on the Raritan pollution problem by Rutgers University and the State Division of Environmental Sanitation.

Detroit moves toward new speed-way

Detroit has contracted to complete the $134,000,000 Ford and Lodge expressways inside the city.

The 28-page contract provides for $80,000,000 to be raised by issuance of revenue bonds to speed construction, as well as $54,000,000 to come from annual appropriations over the years. City, state, county and federal aid are all expected to contribute. Bonds will mature in 1976.

The tri-party agreement between state, local and federal officials is superceded by the new contract.

New routes are outlined. The Lodge project will continue north and west to join the James Couzens highway at Wyoming Avenue. The Ford route will move from a point east of Gratiot Ave. and south of Harper Ave., but the exact right of way has yet to be selected.

Winter ruins roads of Indiana counties

Winter damage to the roadways of Indiana counties is in the millions, pushing road repair work into the forefront this year, as against road extensions and improvements (ENR, March 22, p. 4).

Reports from eleven counties indicate damage amounting to $3,015,000 in road repair work for the period immediately ahead. For the sixty counties of the state, damage estimates vary from $18,000,000 to $24,000,000.

Florida road board drops contract extension policy

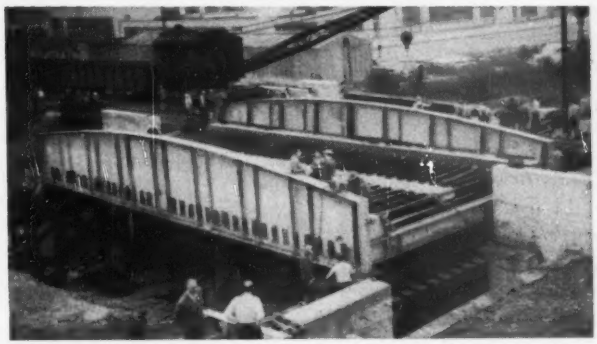
Excessive use of supplemental agreements in highway contracts has been ruled out by the Florida State Road Department, at Tallahassee.

This decision resulted from criticism by Governor Fuller Warren, and from a departmental policy that followed a court order forbidding noncompetitive agreements for equipment rental.

In 1950, the state issued two contracts for which supplemental agreements more than doubled the original project scope.

One with L. L. Hall Construction Co. of Orange Park, originally was for $204,000 worth of road work in De Soto County. The project was extended in three supplemental agreements that added $262,000 to the contract amount. Another contract for $31,000 with the Mac Asphalt Corp., was extended by $39,000.

Quick work on bridge replacement



With only nine hours of traffic interruption, this 66-ft bridge designed by engineers of the Chicago & Northwestern Ry., was completed recently as part of a street-widening project in West Allis, Wis. Preliminary construction was carried on falsework bents adjacent to final location, while a temporary structure handled traffic between new abutments. The bridge was riveted up complete, waterproofing membrane and asphalt plank protection were placed and ballast applied on the span. Ties were laid on the ballast ready for the rails. As moving began the temporary bridge was demolished. Two air-operated jacks shifted the span on four roller units with 4-in. dia rollers, which rode on 6x1½-in. steel plates attached to the tops of the falsework bents. The span was then lowered onto its bearings by hydraulic jacks placed on the bridge seats under the end floor beams of the span. Rails then were laid and connected with track so traffic could be resumed.—Milwaukee Journal photo.

In both cases State Road Chairman Alfred McKethan deemed the original-contract unit prices so low that new bids would not obtain cheaper work.

Temporary link announced for Ohio-Penna. pikes

Highway and turnpike authorities of Pennsylvania and Ohio have reached final agreement on a temporary highway at the western terminal of the Pennsylvania Turnpike to link with Route 90 just inside the Ohio state line at the two-state border.

The Pennsylvania turnpike, it was explained by E. L. Schmidt, chief engineer of the Pennsylvania State Highway Department, will stop eight-tenths of a mile east of the state line. A township road will be rebuilt to carry the toll road's 2,000 vehicles a day onto Route 90 at a point 600 feet west of the state line.

This temporary highway will be a two-lane road, Schmidt said, for which the Pennsylvania Turnpike Commission will pay construction costs.

The western extension of the turnpike is expected to be completed about November 1 of this year. The Ohio trans-state toll road will take at least another year to link with it.

Heavy trucks cannot go over Route 90, Ohio officials claim.

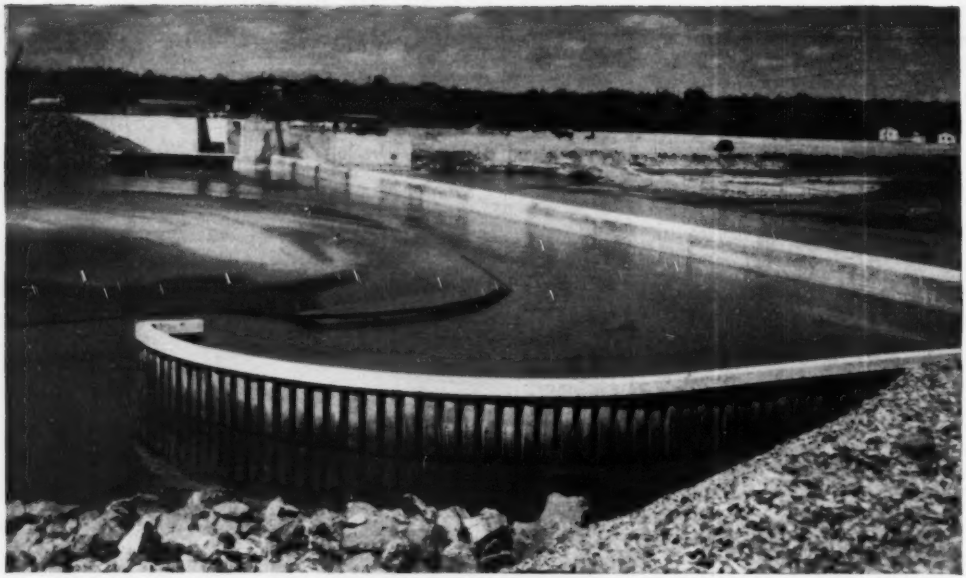
New York Thruway needs engineering personnel

The largest single problem facing the New York State Highway Department is a shortage of engineering engineers, according to J. Burch McMorran, chief engineer of the Department of Public Works.

In a speech at the 12th annual convention of the New York State Association of Highway Engineers, he told how the state has a total of $140 million allocated for a tremendous highway construction program. "However," he stated, "we may be in the embarrassing situation of having more money than men."

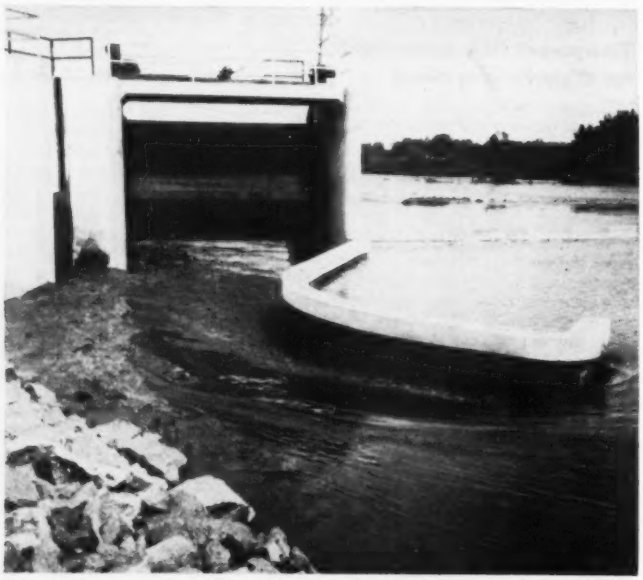
The Thruway program alone is slated for $70 million worth of work. He said the war and an interim period during which little major highway work was done "left us with a gap in acquiring new young men." Present plans are to call in private engineering consultants and have state engineers serve in supervisory and inspection capacities.

McMorran anticipates little trouble in obtaining materials. He claims that although steel orders are filled slowly, they do come in. And as a result of credit restrictions in building, lumber and cement products are, he reports, in ample and adequate supply.



CURVED DIVIDE WALL causes curved flow, keeps coarse bed load next to wall while relatively clear water next to bank goes into Courtland Canal. Superior Canal headworks are in background.

Curved wall at dam keeps sand out of irrigational canal



HEAVILY LADEN WATER on inside of curve goes through sluice gate, back into river. Water carrying much less sand goes to headworks, left.

BUREAU OF RECLAMATION engineers count on inexpensive new design features of recently completed Superior-Courtland diversion dam near Bostwick, Neb., to reduce the amount of coarse sediment carried into irrigation canals.

This $1,783,000 dam on the Republican River—it is part of the $34,000,000 Bostwick Division project in the Missouri River Basin—incorporates a curved training wall at each canal diversion, to trap bed load before water goes into the irrigation canals. Specifications for the installation were worked out by sedimentation specialists at the USBR hydraulics laboratory in Denver.

Training walls of steel sheetpiling extend upstream from a point between the overflow weir and sluiceway on each side of the river. Each wall curves toward the river's axis, establishing curved flow to the sluiceway and headworks gate. Bank-side portion of curved flow goes through the gate into the irrigation canal. Faster-moving sediment-filled water on the flow's wall-side goes through the sluiceway and back into the river below the dam.

Elevation of the guide walls is the same as that of the dam's overflow section. Thus, during floods, the dividing walls will be completely submerged.

• **Saving in dollars**—Results of tests—on the most efficient of seven test-bed

designs studied at the Denver laboratory—indicated that about two-thirds of the coarse sediment will be diverted from the irrigation canals by the curved guide walls. It is estimated that the $19,000 additional cost for the two walls will save area farmers some $40,000 annually in canal dredging expense. Water is expected to start running through the canals during the next irrigation season.

Hydraulic model studies for the Superior-Courtland diversion dam took 10 months. A 1:25 undistorted scale model of half the diversion weir and the Courtland canal headworks and sluiceway was built. Primary purpose was to find the headworks design that would pass the highest percentage of the stream's bed load through the sluiceway.

The many various designs tried were compared on the basis of the ratio of sand concentration in the water passing through the sluiceway to sand concentration in water passing through the headworks: $\frac{C_s}{C_h}$.

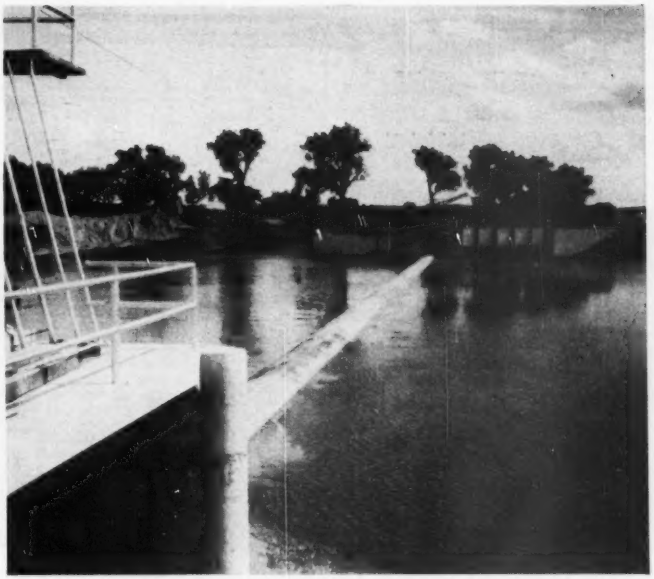
Originally design tested for the Courtland headworks and sluiceway gave a ratio of $\frac{C_s}{C_h} = 0.68$ for the standard prototype discharge used: 400 cfs through the headworks and 200 cfs through the sluiceway. The first design changes, using upstream guide walls, were unsuccessful and showed no improvement over the original design. This was partly due to the greater turbulence created in front of the headworks. The turbulence caused a larger percentage of the bed load to be picked up and carried through the headworks as suspended load.

• **Best results**—A fourth change, using the curved divide wall between the overflow weir and the sluiceway, proved to be the most favorable, resulting in a ratio of $\frac{C_s}{C_h} = 6.63$.

Divide wall for the Courtland headworks on the south side of the Republican River, has a 55-ft straight section plus 46 ft on the curve. The smaller Superior divide wall is about 50 ft long overall.

Further tests with this type of wall—involving changes in alignment of the bank of the pool excavation, length of wall and wall location—failed to show any additional improvement in its desilting characteristics or capacities.

Experiments were made in incorporating a vortex tube across the face of the headworks and a narrower sluice gate (10 ft instead of 20 ft). The vortex tube is a U-shaped steel section set in the streambed, at 45 deg to direction of flow and with open side up, to trap and carry off coarse material being carried along the bottom.



DIVERSION DAM near Bostwick, Neb., is an irrigation structure on the Republican River in the Missouri Basin. It cost $1,783,000; training walls cost only $19,000.

These tests indicated an even greater improvement in sediment distribution, but the vortex tube and narrower sluice gates are not used in the Superior-Courtland dam.

Because it is the first of several diversion dams to be built in the Kansas and Lower Platte basins, the Superior-Courtland design was used as the starting point in the model studies at the Denver laboratory. Design of the Superior-Courtland dam was already complete and construction under way before the model testing could be finished, so radical changes could not be made in this installation. Further tests pursuing the same principle have been made for headworks and sluiceways of the Republic diversion dam, to be built downstream from Superior-Courtland.

Results of these tests will be incorporated in the design of the Scandia diversion dam, still farther downstream on the Republican River, and in design of dams to be built in the Lower Platte River basin.

Bureau of Reclamation engineers indicate that the curve principle of diversion has not worked so well in sediment-control studies for Republic dam because of narrower headworks and smaller water discharge involved. But use of the vortex tube continues to show promise. More information is being sought on the proper size, shape and location of the tube for the most favorable operation in controlling sediment.

• **Not the last word**—Engineers who worked on the Superior-Courtland diversion dam headworks emphasize that the design is not a complete answer to the increasingly expensive problem of controlling and removing coarse sediment carried into irrigation canals by water diverted from sediment-laden streams. They feel, however, that the curved divide walls will prove valuable at other dams where conditions are similar to those found at Superior Courtland.

On some of the Bureau of Reclamation's largest projects, elaborate desilting works have been built, such as those on the All-American canal system in Southern California. On the smaller projects, however, the cost of extensive desilting structures cannot be justified; and simpler and cheaper means must be devised. Use of sluiceways to carry sediment past the diversion weirs by wasting part of the water has been employed in many instances. Some of these structures have proved satisfactory, but many have failed to exclude the coarse sediment from the canal system and frequent dredging of the canals has been necessary to remove sediment.

Hydraulic model studies on the Superior-Courtland diversion dam were made by O. S. Hanson under direct supervision of E. J. Carlson and C. W. Thomas. E. W. Lane, consulting hydraulic engineer, provided advice and guidance throughout the testing program.

SIMPLE, CLEAR CUT LINES are a feature of a 110-ft-span bridge in King County, Wash. Bridge is supported by two all-welded steel box girders made up of thin plates.

Steel box girders support highway bridge

Homer M. Hadley
Consulting Engineer, Seattle, Washington

THIN STEEL PLATES welded into box girders form the support for a recently completed bridge in King County, Washington. Making the design feasible is a unique stiffening system inside the girders that includes corner trusses of ¾-in. bars.

Advantages include: low cost due to low weight of steel, extremely simple and easy erection, and high torsional rigidity because of box section.

The bridge carries a two-lane road in King County, Washington, across the south fork of the Snoqualmie River. It is located at the town of North Bend, 30 mi from Seattle.

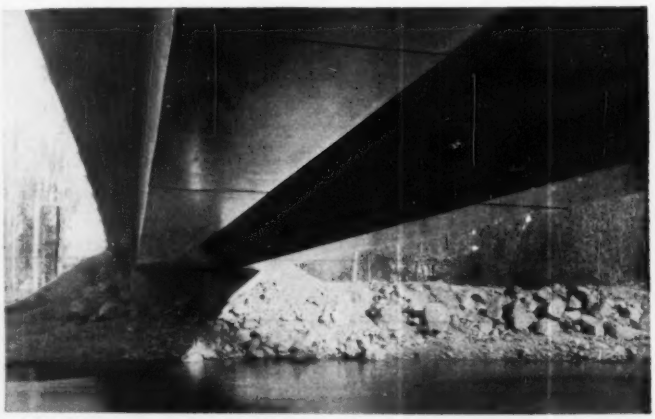
All stiffening members are inside the steel boxes. In addition to vertical and longitudinal web stiffeners, such as would be included in a plate-girder design, the corner trusses act to make the assembly extremely rigid.

Pairs of semicircular shear connectors made of 2x¾-in. flat bars are welded to the top plate. Attached at a 30-deg angle, they are spaced 3 ft 9 in. apart. One end of each connector is welded on above the web plate and the other end above the top of the upper interior truss bars.

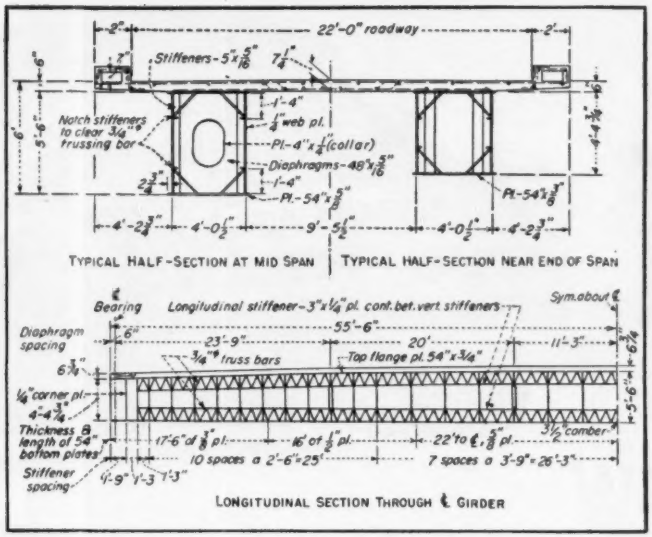
Thus, once the deck slab has attained its strength, the upper ends of the truss bars may be regarded as fixed at the points where the shear connectors are attached. Slab deflection is negligible on the short 4-ft span between girder webs. It therefore follows that the lower ends of these truss bars may be regarded as rigid and fixed where they contact the web plates at the upper longitudinal stiffeners.

Besides this, the inclined truss bars, once welded to the main plates, act in conjunction with them as inclined bar joints spanning between the transverse diaphragms, which are about 22 ft on centers. Therefore, the unbraced height of the web plates is reduced to only that distance between the upper and lower longitudinal stiffeners. Further, the compression flange plate during construction is adequately braced and stiffened by the bar joist action created by the trussing bars.

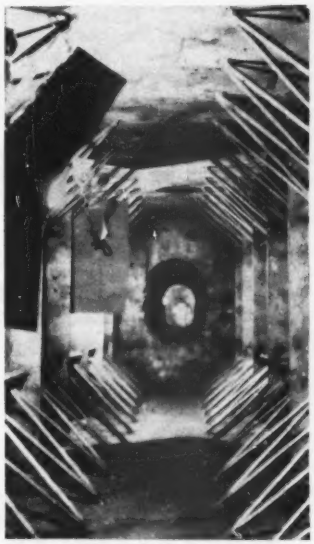
Longitudinal stiffeners, 3x¾-in. in



NO TRANSVERSE BRACING is necessary between the steel boxes because the individual units are sufficiently rigid. Maintenance is minimized since enclosed interior is airtight and flat exterior surfaces are easily painted.



STEEL BOX DETAILS are kept simple for easy fabrication. All shop connections are welded. Concrete deck includes two small concrete box girders at each edge under the walkways. There are manholes for access into steel box interiors.



CORNER TRUSSES built up of ¾-in. bars are elements in stiffening. (Dark object at left is light shield for camera.)

section, are used on each web plate where the inclined bar truss contacts these plates. Early design called for such stiffeners only below the top bar trusses. The lower reinforcement was added for extra rigidity. In a later bridge that has longer girders, stiffening members are being added both top and bottom where diagonal trussing bars contact the flange plates. This later bridge is not yet being built.

The girders carry directly all dead and construction loads; live loads (AASHO H15-44) are carried by composite action between girder and roadway slab.

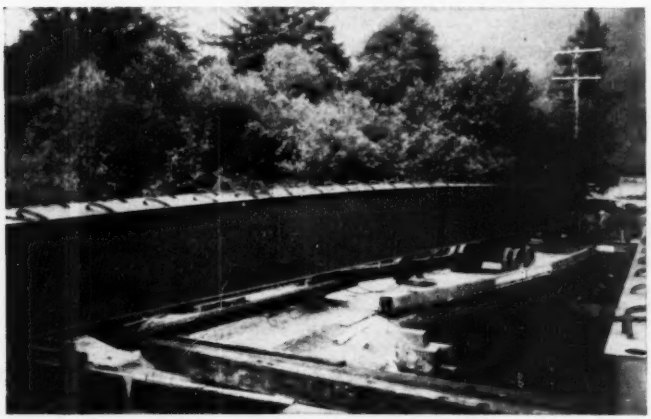
• **Rigid assembly**—The extremely light plates employed would normally tend to spring and bow. But with the bracing welded into place, a very stiff and rigid girder was produced. The girder likewise has all the torsional rigidity that results from having its material far out from its longitudinal axis. The ordinary plate girder with its single web does not compare with the box section in this respect. It is for this reason that no cross bracing of any kind between the box girders other than that afforded by the concrete roadway slab was used here.

Welds in the four main corners are continuous as are welds of the transverse end plates. This seals the interior. Access is available through sealed manholes in the top of the girders and at both ends.

The girders were completely fabricated in Seattle by the Isaacson Iron Works. Each 36,285-lb girder was trucked about 30 mi to the bridge site. There the units were backed across a log detour bridge that closely adjoined the permanent bridge alignment. From the truck the girders were skidded sideways onto false bents and slid into position on the abutments. This unloading from trucks and the connection to anchor bolts constituted the full field erection work.

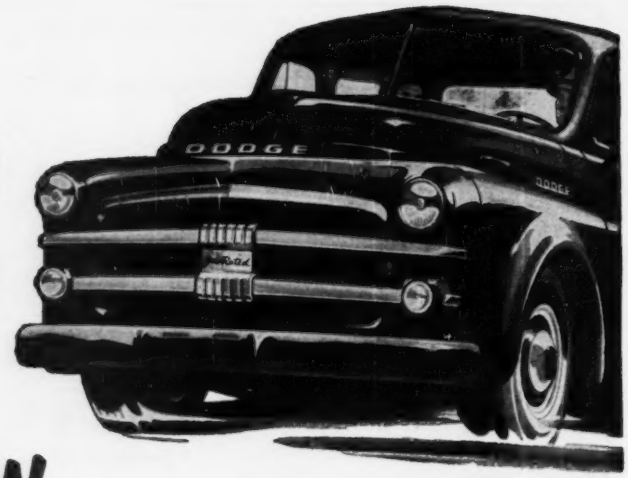
The bridge was built by T. N. Buchanan Co of Seattle, Washington. Contract price for the full bridge was $37,440.17. This includes removal of the old bridge, providing a detour bridge and a small quantity of rock riprap. Of the total contract amount, $18,597.49 was for the steel girders together with their portion of the roadway slab and handrails.

The bridge was designed by the writer for King County at the direction of D. L. Evans, county engineer. An adaptation of this design was submitted in the 1949 Welded Bridges of the Future Program of the James F. Lincoln Foundation.



COMPLETED GIRDERS were hauled to site ready for installation. The half-circle loops on top of the girder will act as sheer connectors to transmit shear from concrete deck to steel box girder.

"Job-Rated" for CONTRACTORS



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CABLES placed in a diamond pattern prestressed a two-lane road in two directions.

Road prestressed to prevent cracks

IS PRESTRESSED CONCRETE suitable for road construction? British engineers are trying to find out. They have built a 400 ft long prestressed, two-lane highway at Crawley, Sussex. Strain gages in the 6-in. slab will indicate the behavior of the road under traffic.

The engineers believe that prestressed concrete may be better for roads than reinforced concrete because it should prevent cracks, reduce the number of expansion joints, improve riding quality, and lower maintenance costs. Disadvantages include difficulty of replacing portions of the road, thus limiting possible applications to non-urban areas, and the possibly complicated nature of expansion joints if the sections are very long. Construction cost is also an important consideration.

• **Design considerations**—A prestress of 200 psi was decided upon, so that at least 100-psi compression would be in the slab after losses due to subgrade friction. This stress is not sufficiently high to prevent cracking under loads and temperature changes, but the cracks are expected to be small and should close upon removal of the load or stresses causing them.

Prestress was applied with cables consisting of twelve 0.2-in. dia high-tensile strength steel wires. To impart a two-way prestress and to avoid anchorages at the ends of the road, the cables were placed in a diamond pattern at an angle of 18¼ deg with the center of the highway. At the ends of the 400-ft span, they were curved to anchorages in a side haunch.

With the wires grouped around a 16-ga mild-steel wire helix, the cables are 1¼ in. in diameter. To obtain a suitable cover over them, the engineers specified a 6-in. deep slab. Previous prestressed road construction at Luzancy and Esbly in France, and runway construction at Orly Field, near Paris, had shown that a slab about 6 in. thick was more than adequate for normal road loading.

• **How the road was built**—To reduce construction costs, the engineers decided to use a sub-base of 4 in. of cinders. This, however, has a high coefficient of friction. Consequently, a thin layer of sand was spread and rolled on the cinders and waterproof paper was placed on top.

The sub-base is drained by 3-in. tile drains on each side of the roadway.

Concrete abutments for anchoring the cables were cast alongside, but independent of, the roadway slab. This construction made it possible to embed the anchorages in high strength concrete, and speeded placing of the roadway. Abutments are 12 in. wide and 6 in. deep. Tied to the main slab with ¾-in. dia mild steel bars, they have a 1:3.9 mix having a water-cement ratio of 0.40.

To prevent bonding with the roadway concrete, the cables were inserted in 16-ga steel sheathing prior to concreting. Spaced 7½ ft on centers, this tubing was placed diagonally across the roadway and supported on concrete chairs at 6-ft intervals. Where the cables are curved, holes were formed in the concrete by embedding rubber tubes supported on a short length of wire mesh. When the concrete had hardened, the rubber tubes were withdrawn.

Casting of the roadway followed normal British practices. The slab was placed in four 12x200-ft sections, one section being cast per day. Sections were linked together across the central longitudinal joint with ½-in. dia bars and across the transverse joint with a wire mesh.

• **Prestressing method**—Prestress was applied by four double-acting jacks, about three weeks after the slab was cast. One jack was placed at each end of a cable; the jacks operated in pairs by two pumps.

Elongation of each wire corresponded to a stress of about 180,000 psi. Anchorage was achieved by wedging the wires of each cable in a conical opening. To do this, a conical concrete plug was pushed into place by the second action of the double-acting jacks.

Next, the cables were encased in neat cement grout and the anchorages in the side abutments concreted in.

In view of the difficulty of calculating the actual expansion of the 400-ft long prestressed bay with an unknown subgrade restraint, the engineers decided to place a 5-ft long expansion bay at each end. Each of these consists of hardcore (broken brick or stone) surfaced with tar macadam, incorporating a 2-in. thickness of expansion joint filler. Later, when more accurate information is available, an expansion joint will be designed to fit.

The road was built for the Crawley Development Corp., at Crawley New Town, Sussex. A. J. W. McIntosh, chief engineer of the corporation, assisted in the design of the road along with the Road Research Laboratory, the Pre-Stressed Concrete Co., Ltd., and the County Surveyor for West Sussex. Willment Brothers Ltd. were the contractors.

1 LUMP LIME is shovelled from box cars into a chute that empties into a hammer mill.

2 CRUSHED LIME goes from the hammer mill to a bucket-type elevator. The elevator discharges on the storage floor.

3 LIME from the storage bin drops to a mechanical feeder. It supplies a belt and screw conveyor to the slaker.

4 SLAKING is done with warm water from the carbon-dioxide scrubber. Milk of lime mixed with sludge is fed to water.

5 GRIT settled out in slaking is raked mechanically to one end of the slaker and discharged to sewer.

6 SULPHATE of ammonia in float-level-controlled discharge crock. Feed is adjusted by changing discharge-tube level.

Soft, ample supply guaranteed by Edmonton's second water plant

W. I. McFarland
Power Superintendent
Edmonton, Alberta

DOUBLE FLOCCULATION, double clarification and double recarbonation with filtering and chlorination—that's the prescription for softening and processing variable-quality water in the new 15-mgd plant at Edmonton, Alberta, Canada. The consistent result: A clear water having not more than 75-ppm hardness, no taste or odor, and little color.

• **Stiff prescription needed**—Raw water is taken from the North Saskatchewan river. Its hardness varies widely from summer to winter—110 to 360 ppm. This is due to high portion of glacial and surface water in the summer, and spring-fed water in the winter.

The water plant, fortunately, is located about 500 ft below the city's power station. Condensing water (63 deg F) discharged from turbines provides favorable temperatures for softening even in coldest weather. It also forestalls ice troubles in the plant.

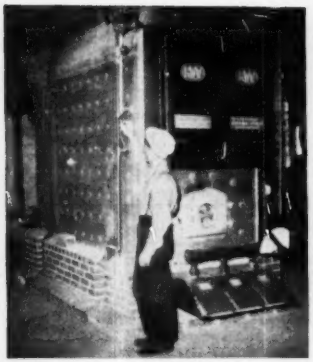
Turbidity also varies widely. It may go as high as 1,200 ppm during spring runoff—with exceptional cases of 1,800 ppm—but in winter it's almost negligible.

High color and swampy tastes sometimes add to the treatment problem. They occur in early runoff from muskegs during spring break-up.

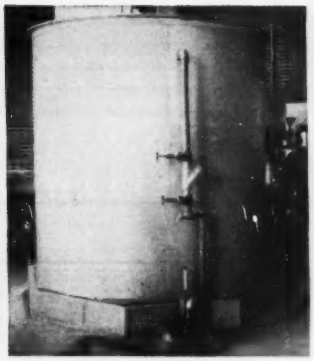
• **Processing in steps**—Raw water, raised from the river to the new plant by low-lift pumps is processed in steps. Under gravity flow, here's unit-by-unit treatment:

1. Influent well—Chemicals are added to raw water: Slaked lime and soda ash plus returned sludge for cold-process softening; alum for clarification; chlorine and sulfate of ammonia for sterilization; and activated carbon for taste-and-odor control.

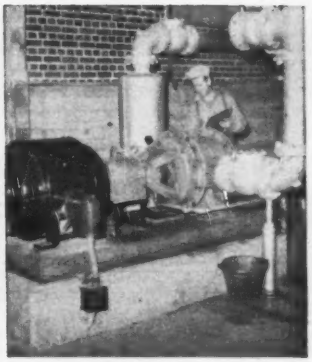
2. First flocculator—Inflow is through ports in bottom of a flume from in-



7 CARBON DIOXIDE is obtained from natural gas burned in standard boiler. Output varies with amount of gas burned.

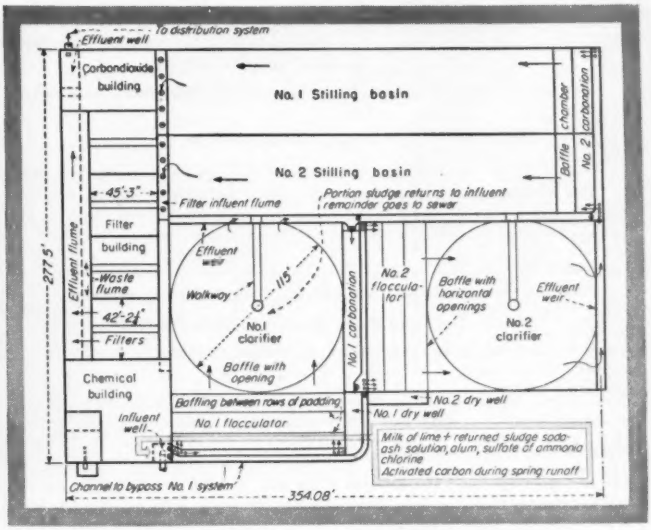


8 GAS IS CLEANSED in a scrubber. In it combustion products pass upward through broken stone as water flows down.



9 SCRUBBED AND COOLED gas is compressed by electric-motor-driven pump, delivered to recarbonation chamber.

10 RECARBONATION CHAMBER. Under pressure the gas bubbles upward through the water from perforated pipes.



11 HARD, TURBID WATER at Edmonton, Alberta is treated by two-stage flocculation, two-stage clarification, two-stage recarbonation, stilling and filtration. All chemicals are added at influent well.

fluent well. The flume extends along one side of the flocculator. Floc formation encouraged by slow mixing with three rows of paddles. With flow at right angles to rows, open-at-the-base baffling between rows forces water to move along bottom.

3. First clarifier—Flow is across a square unit to an overflow weir forming one side of a flume.

Settled sludge is moved to the center by a revolving scraper. Part of it flows by gravity back to the chemical building for mixing with milk of lime; the rest goes to the sewer.

4. First recarbonator—Excess lime is added to water initially to get correct alkalinity for forming magnesium-hydroxide floc. Carbon dioxide—bubbled through settled water from perforated pipes along the channel bottom—uses up this excess.

5. Second flocculator—Similar to the first, speeds formation of floc.

6. Second clarifier—Exactly like the first clarifier, it takes an additional amount of calcium-carbonate floc out of the water. This sludge is wasted.

7. Second recarbonator—A duplicate of the first unit, it also rebuilds the carbonate balance.

8. Stilling basins—Two long, narrow parallel units, these basins normally perform a minimum amount of work. Some solids are settled out in them. The basins, however, are most effective when only one recarbonator is in use. Calcium carbonate is then precipitated in the stilling basin.

9. Filters—Four units with a center gullet and cast-iron wash-water troughs filter water drawn from stilling basins. Flow from them to the clear-water basin as well as to waste is by covered flumes. The 41x44-ft filters are backwashed one-half at a time by a 15,000 gpm pump with a suction in the effluent flume. All control is by hydraulically actuated valves.

• **Handling chemicals**—Delivered in box cars, lump lime is unloaded manually to a chute emptying into a hammer mill. Crushed lime is raised on a

bucket-type elevator to a two-car-capacity storage bin.

Lime goes from storage directly into the feeder. Here it passes by belt and screw conveyor to the slaker. Warm water for slaking (hydration) is pumped from the carbon-dioxide scrubber. Recorded automatically, slaking temperature is maintained as near 170 deg F as possible. Grit from the lime is raked mechanically to one end of the slaker and discharged to sewers.

From the slaker, milk of lime flows to a tank for mixing with return sludge. This mixture is delivered to the influent well by the sludge pump.

Other chemicals—soda ash, alum and activated carbon—are received in paper bags. The first two are bought in carload lots but activated carbon is received in smaller quantities because of limited use.

From the unloading dock, chemicals are raised to storage by an electric hoist. Storage capacity is about 400 tons. Purchasing of chemicals is handled so that soda-ash supplies are high in winter and alum storage is high in summer. This permits timely satisfaction of treatment demands.

Soda ash, after storage, is crushed. This is done in a small hammer mill that discharges directly into the loss-in-weight hopper of the soda-ash feeder. Liquid from the feeder's solution chamber flows into the influent well.

The alum feeder—similar to that utilized for lime—has a hopper from the storage floor. It's filled manually as needed through a trap door. Dry alum—proportioned out by the feeder—drops into the trough carrying soda-ash solution to the influent well.

Sulfate of ammonia, also delivered in solution, together with chlorine makes possible formation of long-lasting chloramine residuals in the water.

A solution of specified-strength ammonium sulfate is mixed in a 50-gal stone crock on the storage floor. This solution flows by gravity to another crock on the operating floor. Constant level is maintained in the lower crock by a float valve, and discharge from it is varied by altering difference in head between the control level and level on the discharge.

Chlorinators are in a separate room adjacent to the chemical feeders. Water to operate chlorinators is kept at 70 deg F by natural-gas heaters with automatic control.

Carbon dioxide is obtained from natural gas, burned in a standard 5-psi boiler. Combustion products are taken into a scrubber in which gases pass upward through broken lime stone while water passes downward through the bed. Cooled and scrubbed, the gases are compressed by a pump and forced into the recarbonation chamber.

Cooling air, heated by steam from the boiler, is forced through a duct system for heating the filter-and-chemical building in winter. Warm air is diverted up the stack in summer.

• **Original plant**—Edmonton's original plant, providing soft and clarified water, has a capacity of 10 mgd. With the new plant total treated-water capacity is 25 mgd. This is ample for normal population growth and industrial development until 1957. Present population is 148,000.

• **Credits**—Control of water treatment and softening is under E. L. Smith.

Flocculating and sludge-collecting equipment is by Dorr Co., Stamford, Conn. Filter and control devices are by Roberts Filter Co., Darby, Pa. The new plant was built by the Poole Construction Co. of Edmonton.

SOFTENING IN A NUTSHELL

The softening process employed at Edmonton is conventional:

1. Calcium hydroxide reacts with calcium bicarbonate to give calcium carbonate which is precipitated:

$$Ca(HCO_3)_2 + Ca(OH)_2 \longrightarrow 2\,CaCO_3 \rightarrow + 2\,H_2O$$

2. Magnesium sulfate, slaked lime and soda ash react to precipitate magnesium hydroxide and calcium carbonate. Excess lime is added to give favorable alkalinity for precipitating magnesium hydroxide:

$$MgSO_4 + Ca(OH)_2 \longrightarrow Mg(OH)_2 \downarrow + CaSO_4$$

then

$$CaSO_4 + Na_2CO_3 \longrightarrow CaCO_3 \downarrow + Na_2SO_4$$

The sodium sulfate (Na_2SO_4) is not hardness-forming and remains in solution in the water.

3. Excess lime is neutralized by adding carbon dioxide (CO):

$$Ca(OH)_2 + CO_2 \longrightarrow CaCO_3 \downarrow + H_2O$$

This is called recarbonation. It converts calcium hydroxide to calcium carbonate which is settled out. The small amount of calcium carbonate that may remain in the water is converted to calcium bicarbonate. Recarbonation also eliminates flat taste.

DESIGN AND ENGINEERING DATA

Water Treatment Plant, Edmonton, Alberta, Canada

Treatment: Softening by lime-soda process, clarification, filtration and chlorination.
Capacity: 15 mgd rated.

Water Supply: North Saskatchewan River. Hardness from 110 ppm in summer to 350 ppm in winter. Turbidities to 1,200 ppm at high water with exceptional cases to 1,800 ppm.

Water delivered at 75 ppm of hardness.

Chemical Handling: Lump lime delivered in box cars. Crushed in 5 ton per hr. hammer mill and elevated to storage tank. Other chemicals received in sacks and raised by hoist to storage on floor above feeder floor.

Chemical feeders: Belt-type gravimetric feeders 1,800 lbs per her for lime and alum.

Loss-in-weight feeder for soda ash with solution tank, (500 lb per hr). Feeder for activated carbon (300 lb per hr).

Mixing: All chemicals fed into raw water in influent well.

Primary clarifier: Flow from flocculators to 115 ft square clarifier. Partial return of sludge to sludge pump.

Recarbonation: Carbon dioxide from natural gas boiler fed into carbonation chamber by perforated pipes near bottom of chamber.

Secondary clarifier: Duplicate of primary and followed by recarbonation.

Stilling Basins. Two parallel basins 57 x 270 ft.

Filters. Four at 41 x 44 ft with Wheeler bottoms. Backwashed in halves.

Back Wash: Water pumped by pump with 250-hp motor at 15,000 gpm.
Sludge disposal: Returned to river.

Chlorination: Two chlorinators each of 300 lb per 24-hr capacity. Pre-chlorination used at present.

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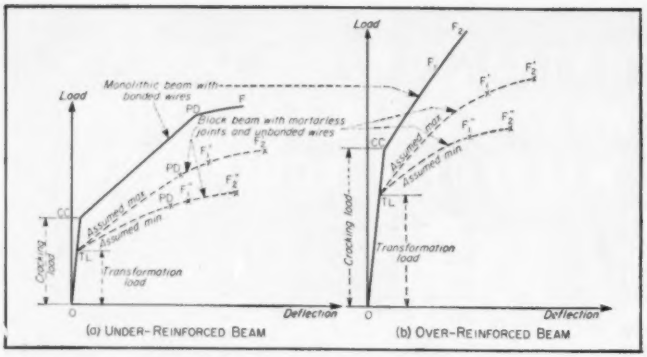


Tests results show higher strengths for . . .

Prestressed beams with bond

P. W. Abeles
Consulting Engineer
London, England

WHEN CONCRETE BEAMS are prestressed with steel wires, tests show that bonding the steel to the concrete is advantageous. Resistance to failure is higher, cracks caused by overloading are much narrower and better distributed, and deflection after cracking is considerably smaller than for beams in which the wires are not bonded to the concrete.

There are many systems for prestressing concrete, but the essential difference among them is the basic manner in which prestress is applied and held. In general, prestress may be transferred from steel to concrete in three ways: (1) by bond; (2) by anchoring the wires to the concrete at the ends of the beam with no bond between wires and concrete in between; and (3) by anchoring the wires at the ends of the beam and also grouting them in to establish bond.

For bonded prestress, thin wires are nearly always used. They are tensioned and then anchored temporarily to the formwork or to independent anchorages. Next, concrete is placed in the form. (An alternative is to use grooved precast members, place the wires in the grooves, tension the wires and fill the grooves with mortar.) After the concrete attains sufficient strength, the wires are released from the temporary anchorages, transferring the stress to the concrete.

For end-anchored unbonded prestress, the concrete beam is cast first. Openings are left so that wires or cables may be placed in the beam without bonding to the concrete. After the concrete attains sufficient strength, the wires are tensioned with jacks reacting against the beam. The wires, then, are anchored at the ends of the beam, thus prestressing the concrete.

This procedure is also followed in the third system of prestressing; but a further step is added. The wires are grouted in, connecting the steel and concrete. Though grouting was originally used mainly for protection against corrosion, tests have shown that grouting also improves other properties of prestressed beams, particularly resistance to deflection, cracking and failure. The improvement is due to the bond between steel and concrete.

• Bonded vs. unbonded prestress—In any of these systems, the beam may be a single unit or a series of blocks tied together by the prestress. When blocks are used, the joints between them may or may not be bonded with mortar. Since a monolithic prestressed beam behaves differently from one made of disconnected blocks, these different types of structures may be considered in comparing bonded and unbonded prestress.

In a monolithic member with bonded wires, extension of the steel is relatively small, even after the concrete cracks. Bond is destroyed only in the cracks themselves and in their immediate vicinity. Cracks are well distributed over the length of the member.

In contrast, stretching of the steel is considerably greater when wires are not bonded, since the steel is free to lengthen over the full distance between end anchorages. Relatively few cracks occur in the concrete, but these widen rapidly as the load is increased.

• Types of failures—Difference in behavior of a monolithic beam with bonded steel and one made up of blocks with mortarless joints and unbonded steel are shown by the typical load-deflection diagrams (left). Two cases are distinguished: (1) under-reinforced beams and (2) over-reinforced beams.

Failure of under-reinforced beams is primarily caused by the steel after considerable deflection occurs. Either the wires may fracture, or the beam may yield excessively with consequent crushing of concrete in the reduced compression zone. Even then, the calculated steel stress will reach the tensile strength if the wires have a definite yield point. However, with larger diameter rods, bond is less efficient and lower stresses may be reached at failure than with thin wires.

Failure of over-reinforced beams is due to limited compressive resistance of the concrete at a stage when the deflection and state of cracking do not give any warning of danger.

Tests show that in an under-reinforced prestressed beam with well bonded wires, the calculated steel stress at failure will always reach, and often exceed, the tensile strength of the steel. If, however, the stress-strain diagram of the steel shows a distinct extension at a yield point, the yield point—not the tensile strength—is of significance in determining the strength of the beam. Thus, a designer can determine quite definitely the minimum failure load for beams with bonded wires (corresponding to point F on the above load-deflection curve). For this purpose, a plastic stress distribution may be assumed for the concrete; but this is not essential, since the lever arm of the stresses varies only slightly for different stress distributions.

• When prestressed beams crack—The load-deflection curves shown above in simplified form have two characteristic points—CC, commencement of cracks, and PD, beginning of permanent deformations. Point CC for the monolithic beam with bonded wires corresponds to the cracking load, when the beam ceases to act like a homogeneous material and behaves more like a cracked reinforced concrete beam. There is a sharp change of slope at CC.

For over-reinforced beams, however, difference in the slope of the load-deflection curve on either side of point CC is less; the steel does not stretch excessively, and plastic deformation of the concrete is small. The failure load cannot be calculated as easily as for under-reinforced beams. There are two limits, F_1, and

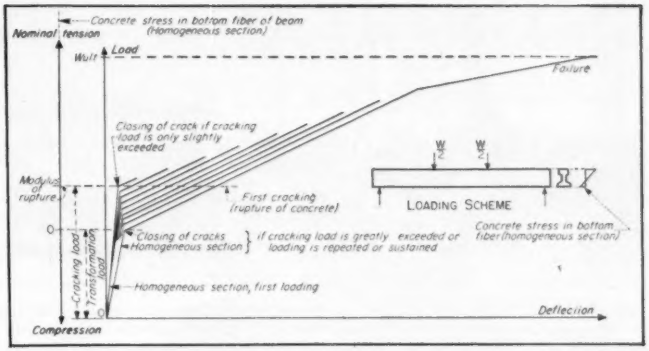
F_2, between which failure may occur, depending on strength of the concrete and kind of stress distribution. Obviously, if the exact stress-strain properties of the concrete were known, it would be possible to compute the failure load more precisely.

No test data are available for beams with unbonded wires. Consequently, rather indefinite values are shown for the example (block beams with unbonded wires) in the load-deflection curves. Two dash-line curves—an assumed maximum and a minimum—are given for the load-deflection relationship after the joints open at the "transformation" load, TL, when the compressive stress at the outer surface disappears. (Difference between cracking load for a monolithic beam and transformation load for these beams with unbonded wires equals the cracking load in a non-prestressed concrete beam). Deflection of beams with unbonded wires depends to a great extent on the type of loading and thus on the extension of the steel, as well as on the properties of the steel.

Properties required for the bonded wires used in monolithic beams differ from those required for the unbonded steel. In members with bonded wires, extension of the steel is limited to the width of cracks. In beams where the steel is free between the end anchorages—as in steel-cable suspension bridges—the proportional limit is of utmost importance and high stresses must be excluded because of excessive deformations. This limitation is not necessary when the steel is bonded to the concrete.

The monolithic system with bonded wires and block beams with unbonded wires compared here are two extreme cases. There are many intermediate cases. For example, when end-anchored wires are grouted in, the beam may behave as with bonded prestress if the grouting is fully efficient; or it may continue to act as a beam with unbonded prestress if the grouting is inefficient. Another example is a block beam with bonded wires and with good mortar joints, which will differ only very slightly from a monolithic beam with regard to cracking and failure. If the joints are mortarless, block beams with bonded steel will behave like a monolithic beam in which cracks have opened; but obviously, block-beam joints will open at much smaller loads than those causing cracks to form in a monolithic beam.

• A strange phenomenon—Another set of load-deflection curves is shown above to demonstrate another characteristic of bonded prestress. These curves are based on tests made on an under-reinforced monolithic beam with bonded wires.



LOAD-DEFLECTION CURVE for a prestressed concrete beam with bonded wires.

The curves distinguish between several conditions affecting cracking. One is the case where the cracking load, corresponding to the modulus of rupture, is exceeded only slightly and rarely. When the overload is reduced, the cracks, the diagram shows, will become invisible when the cracking load is reached. When the excess load is further increased, or often repeated, the cracks open and close at loads smaller than the cracking load. Finally, they close only at the transformation load, the load at which tension in the outer surface of the concrete changes to compression.

It would normally be expected that in all cases of overload, the cracks would close at the transformation load, since only at this value does the precompression that was previously interrupted at the cracks act again over the entire length of the member. Closing of the cracks at higher loads is an unexplained phenomenon. However, this extraordinary resilience of prestressed concrete justifies consideration of nominal tensile stresses in the concrete greater than the modulus of rupture, although at such a loading the concrete is cracked and temporarily a quite different stress distribution occurs.

• Conclusions—From the foregoing investigations, it may be seen that bond between prestressing elements and concrete is of great advantage. It is, therefore, advisable wherever possible to grout in the steel when end anchorages are employed.

It is also advisable to avoid over-reinforced sections because of the suddenness and uncertainty of failure. While the steel has definite strength properties, concrete of uniform quality is difficult to produce, and the sudden failure of over-reinforced sections depends on the strength of the concrete. On the other hand, strength of the concrete has little influence on failure of under-reinforced beams.

It is obvious that a certain factor of safety must be ensured with prestressed concrete as with other materials. The stress distribution under working load, as already mentioned, is like that of a homogeneous material and entirely different from that at failure. Thus, there is no particular relation whatsoever, as with other materials, between a permissible stress under working load and the stress at failure. Consequently both loading stages must be investigated, and in addition, that at transfer of the prestress. The last mentioned study is necessary, since too high a concrete stress causes increased plastic flow.

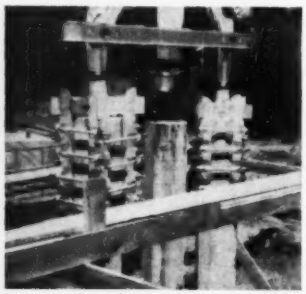
In any event, it may be advisable to employ different factors of safety, depending on whether the construction is under or over-reinforced. For under-reinforced beams, a factor of 2 (related to dead plus live loads) seems to be ample; or, say, a factor of 1.5 for dead load and 2.5 for live load. For over-reinforced beams, a factor of 2.5 to 3 should be considered in view of the variation in strength of the concrete.

Power begins to flow from Kortes Dam electric plant

The Kortes Dam and power plant on the North Platte River in Wyoming are virtually completed and the full 36,000-kw capacity is being channeled into homes and industries of the Missouri River basin, according to a report by the Missouri Basin Field Committee of the Department of the Interior.

The dam is a concrete structure, 240 ft high, situated in the rocky canyon of the North Platte between Seminoe and Pathfinder dams in Wyoming. (ENR Apr. 18, 1946, p. 69).

BEARING CAPACITY OF PILING is determined for California bridge structures by this portable equipment. An A-frame truss with 120-ton hydraulic pressure cell makes the test. Constant pressure, hydraulic power equipment is truck-mounted.



CAST-IN-PLACE concrete anchor piles (left) are attached to the truss unit by bending reinforcing bars over arms at the ends of the truss. Timber, steel or precast concrete anchor piles are attached by friction type clamps (right).

Portable load testing equipment checks bridge foundation design

LOAD TESTS to determine pile-bearing capacities are now being made on many bridge structures built by the California Division of Highways.

Lightweight, portable equipment makes such work economically possible even on many of the smaller structures because it is easy to get to the job and simple to assemble.

(For a similar device used on soils in Georgia see ENR Feb. 16, 1950, p 36.)

Purposes of the tests are two: (1) To justify for each structure possible use of heavier allowable loads and thus fewer piles, and (2) to accumulate data that may eventually substantiate higher allowable loads in specifications.

Of course, the foundation design in each instance is based on the usual type of preliminary investigations. Borings, penetration and skin friction tests are conducted. Undisturbed soil samples are taken and analyzed. Pile-loading tests in general, however, are not conducted during the design stages, because of the expense.

So California engineers require that the first piles driven on a job be for test purposes. That's after the contract is let, of course. Results are analyzed rapidly so as to release the driver for further work as soon as possible and thus avoid expensive delays in the construction operation.

• **Higher loads desirable**—There are many instances where greater than AASHO standard load per pile is desirable. But on bridge jobs if federal-aid money is involved, the Bureau of Public Roads won't allow greater than standard loads unless tests are made.

For example, state engineers may determine by preliminary investigation that it may be more economical and seem quite feasible that a particular bridge foundation be designed for an allowable load of 35, 40 or even 50 tons per pile on concrete cast-in-place piling, instead of the 32-ton AASHO maximum.

• **Three piles needed**—In making the pile loading tests, three piles are driven in a row at normal pile spacing as shown on the plans. The center pile is load-tested, with the outside pair acting as anchor piles.

The loading equipment includes a simple loading truss, a 120-ton capacity hydraulic pressure cell, and panel-truck-mounted hydraulic power apparatus to develop the necessary hydraulic pressure. The truss is of steel construction and the members are pin connected. Extra pin holes are located along both the horizontal and vertical members to meet spacing variations.

For concrete piles there are two ways of connecting the loading truss to the anchor piles. In the case of cast-in-place piles, reinforcing bars are cast in the concrete and left extending from the top of the pile, then bent over the arms of the loading device and welded one to another. For timber, steel or precast concrete piles, a friction type clamp device fits over the arms of the truss and clamps tightly on the upper part of the anchor piles.

The hydraulic pressure unit is rigged to maintain constant pressure of the desired increment, even though minor pile settlement occurs. This eliminates the continual gage observation and frequent manual application of load that have in the past been required and have been major objections to use of hydraulic tools in work of this nature. The load is maintained by a constant pressure mercury switch and a 1,000-psi nitrogen loaded accumulator.

Complete flexibility in the equipment is possible. Loads may be applied, reduced or completely removed merely by turning a valve. Further, the 120-ton capacity is much greater than is usually feasible by physical loading test set-ups such as the use of large water tanks. The amount of load applied by this California testing device is only limited by the capacity of the hydraulic pressure cell and the resistance offered to pulling by the anchor piles.

• **Soil bearing tests too**—A similar A-frame truss is used by state engineers in determination of safe allowable load for spread footing foundations. In this instance, the truss is of lighter construction and the horizontal beam is considerably longer to insure that the loaded bearing plate is outside the influence area of the anchor piles. This device is used in site investigation work preliminary to design work. Its operation is similar to the pile loading device.

F. W. Panhort is assistant state highway engineer of the California Division of Highways in charge of the bridge department. The testing tools and methods have been developed under the direction of C. H. Harned, senior engineering geologist.

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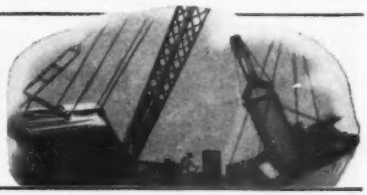

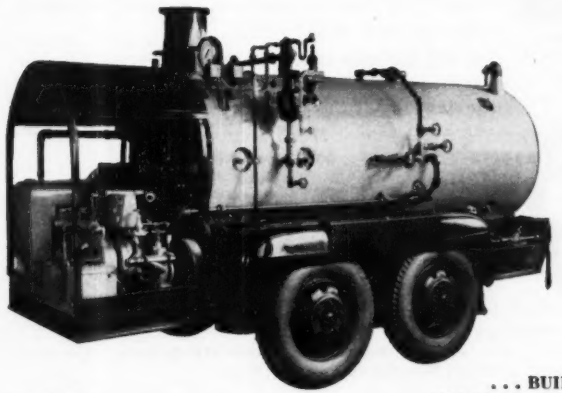

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Send for Bulletin 266

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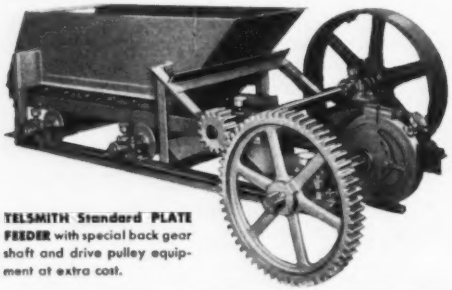

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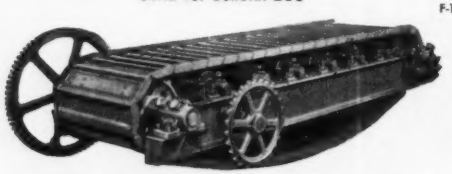

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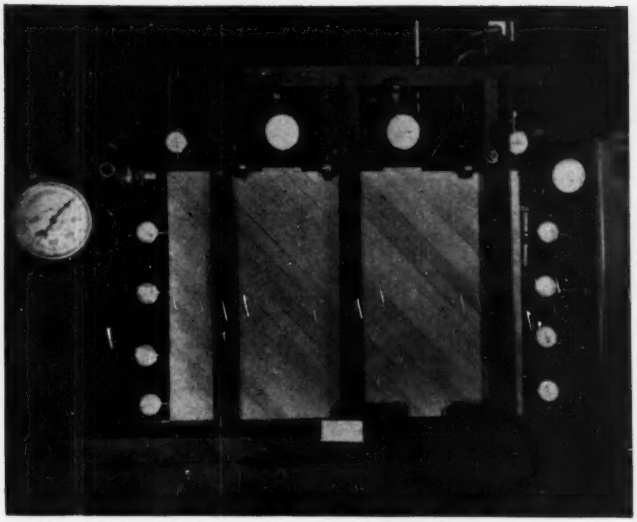

QUARTER-SCALE WOOD PANELS were loaded to failure in Oregon tests. Load was applied by hydraulic jack at upper left corner. Deflections were noted at 14 points after each load increment. Panels simulated shear walls. Tests are aimed at helping engineers design such panels to resist shearing stresses of wind or earthquake load.

Oregon lab tests wood panels

THREE NAILS are not much better than two for diagonally sheathed wood panels acting as shear walls.

That was demonstrated by physical tests made more than 20 years ago and proved again in recent tests. Yet engineers are still designing such panels by assigning a certain number of pounds resistance to each nail.

That means the more nails they specify, the more shear resistance the panels should have. But the tests have shown they're wrong.

The Madison, Wis., Forest Products Laboratory reached this conclusion after conducting tests on wood panels over a period of years (ENR Oct. 24, 1929, p. 656 and ENR Oct. 17, 1946, vol. p. 519). More recent tests have been conducted by the Oregon Forest Products Laboratory. This research, on a series of 24 quarter-scale panels, was summarized recently by John R. Stillinger, chief, industrial services section, of that laboratory in recent talks before the Structural Engineers Associations of northern and central California in January.

The fault could lie in the tests—or rather in interpretation of the test results. While qualitative data were developed, actual quantitative data are lacking. The early tests didn't change design habits. Perhaps the more recent ones, when properly extended and interpreted, will.

These tests were made by the state-financed laboratory because of interest expressed by the West Coast Lumbermen's Assn. This group pointed out that structural engineers make extensive use of wood shear wall panels in providing resistance to earthquake and wind forces in small buildings.

Accordingly, the tests were set up specifically to provide qualitative data that can be applied in design procedure. The results outlined in the foregoing are at this stage preliminary. More complete evaluation of the tests and perhaps even more tests are believed still necessary.

According to engineers attending the meetings at which the test data were discussed, the Oregon studies are the most significant ever made on diagonally sheathed walls.

• **Quarter-scale tests**—Because of the physical test equipment required to test full-scale models, the Oregon research was made on quarter-scale panels. Thus, the results only give indications of what might be expected in full-scale prototypes. It is hoped that full-scale tests can be made to indicate correlation between these quarter-scale models and the larger size. To put it another way, such full size tests would determine the scale effect.

The models were 2 ft high, representing what would be an 8-ft high wall. Lumber used was Douglas fir, kiln dried to about 8% moisture content. Studs, end posts, top and bottom plates and sheathing were surfaced on all four sides. The sheathing measured $\frac{7}{16}$ x $1\frac{3}{8}$ in. to simulate standard 1 x 6-in. sheathing.

Nails used were also on a reduced scale. Sheathing was nailed to the studs and boundary members by $\frac{3}{4}$-in. long, 18-ga, flat-top, steel-wire nails. Top and bottom plates were nailed to the studs by $\frac{3}{8}$-in. long, flat-top nails of similar gage.

The sheathing was continuous across the panel with no intermediate joints. It was free to move, in that the ends of the sheathing did not bear on anything during loading.

The load was applied by a hydraulic jack at an upper corner of the panel. Loading increments were 100 psi or 240 lb. After each load increment, deflections were measured at 14 points along the two end posts and top plate. Close inspection was also made for visible signs of failure. The panels were tested to the point where the maximum load could no longer be maintained.

• **Four variables involved**—Laboratory engineers selected four principal variables for use in the tests, namely: number of nails, height-length ratio method of loading and stud spacing.

Nail variations were one, two and three nails attaching the sheathing to the studs and to side and end framing. The panel height was maintained constant during the tests and the height-length ratio varied as follows: 1:1, 1:1.5, 1:2, and 1:3. Loading involved tension and compression. Stud spacing was 4 and 6 in. to be equivalent to 16- and 24-in. full-scale spacing.

With these variables, eight different test setups of three panels each were made. Basic setup was a height-length ratio of 1:1.5, two nails, 4-in. stud spacing, and loading in compression. This same arrangement was repeated with height-length ratio varying, repeated again with a number of nails varying, repeated a third time with stud spacing varying and finally repeated with loading in tension instead of compression.

• **Test results**—Wisdom of using three duplicates for each test condition was verified by test results. In only two instances was the variation in maximum loading large as compared with other replications for the same setup.

It was found that maximum load is directly proportional to the height-length ratio. For the 1:1 panel, maxi-

mum load was 736 lb; for the 1:2 it was 1,672 lb and for the 1:3 it was 2,553 lb. This result was as could reasonably be expected.

In the case of nail variations, results showed that three nails aren't much better than two. For one nail per panel, the maximum loading averaged 796 lb; for two nails maximum loading averaged 1,316 lb and for three it was 1,494 lb (disregarding in this latter average one obviously low result). This would indicate that three nails add only 13.5% to the maximum loading as compared to two nails. This nail variation result might be one of the most significant developed in the Oregon tests. Heretofore, engineers have designed panels by assigning a certain number of pounds resistance to each nail. In some instances they have gone to four nails per stud nailing to get the necessary resistance. Where such nail loading design is not enough, engineers have specified double sheathing. When this nail loading test result can be properly interpreted, it could change established design procedure.

Maximum loading for sheathing in compression averaged 1,316 lb as compared with 1,480 lb for sheathing in tension. This could be considered the second most significant result of the Oregon tests. That's because engineers have been assuming that such panels have significantly greater resistance to loading in compression and have been designing accordingly. The Oregon tests, on the other hand, show a slight superiority (12.5%) for resistance to loading in tension.

Maximum load for studs spaced on 4-in. centers averaged 1,316 lb as compared with 1,192 lb for studs on 6-in. centers. This particular result is one of the hardest to interpret. When the entire panel is considered, panels with the 6-in. spacing actually had fewer total nails than panels using the 4-in. spacing for the same number of nails per stud. So it's hard to decide how much of the decreased resistance is due to the wider spacing and how much to fewer nails.

The Oregon Forest Products Laboratory was created by the state legislature in 1941. However, it has developed full-scale activities only in the last 2 or 3 years. A timber harvest tax of 5c per Mfbm (log scale) cut in the forest became law July 1, 1947, and is intended primarily to provide funds for the establishment of adequate research facilities. This tax will continue through June 30, 1953. Current expenses are supplemented through state general fund appropriations.

The diagonally sheathed, shear-wall panel testing program represents the first tests of this nature made at the Oregon laboratory. Next series of structural tests will be made on diagonally sheathed roof panels.

Notes on legal decisions

Summaries of decisions relating to construction work prepared by I. Vernon Werbin, counselor at law and engineer, New York, author of Legal Phases of Construction Contracts (McGraw-Hill Book Co.)

Prevention of performance

An action[1] was brought by a contractor to recover a balance claimed to be due under a construction contract. The owner counter-claimed the cost of remedying certain defects in the work. The contractor claimed that the defects in the work resulted from instructions given by the owner as to how the work was to be done and by his interference with the work.

While the court found as a fact that the defects in question resulted from defective performance by the contractor and, therefore, he was liable for the cost of making the necessary repairs, the court stated, in discussing the contractor's claim that the defects in question resulted from the acts of the owner: "It is elementary that there is no breach of a contract where performance is prevented or rendered impossible by the conduct of the other party.[2] It is also generally recognized that a defective performance of a building contract is excused where it is due to the acts of the owner or his representative, unless the contractor has not offered substantial compliance with his contract."[3]

(1) Harris et al. v Holder et al., 239 S.W.2d 645, Supreme Court, of Arkansas, June 5, 1950.
(2) Townes v Oklahoma Mill Co., 85 Ark. 596, 109 S.W.648.
(3) 17 C.J.S., Contracts, Section 46 (a); also, 9 Am.Jur., Building and Construction Contracts, Section 45.

Difficulty of performance

In the absence of a statute to the contrary, conditions arising from a state of war in which this country is involved, will not ordinarily constitute an excuse for non-performance under a contract.

"The rights of parties are measured by the contract which they themselves have made. A contract is not invalid, nor is the obliger thereon in any manner discharged from its binding effect, because it turns out to be difficult or burdensome to perform. It has been said that difficulties, even if unforeseen and however great, are no excuse, and that the fact that a contract has become more burdensome in its operation than was anticipated is not ground for its rescission."

Parties can bind themselves by lawful contracts and courts cannot alter them because they work a hardship. Inconvenience or excessive cost of compliance, though they make compliance a hardship, cannot excuse a party from the performance of an absolute and unqualified undertaking to do a thing that is possible and lawful.[1]

The court in another case[2] stated: "Owners of property have the right to be foolish as well as wise, prodigal as well as provident; and, whichever they are, it is the business of the courts to enforce their contracts freely made and plainly expressed."

(1) Wilson & Co. v Fremont Cake & Meal Co., 43 N.W. 2 d 657 (Supreme Court of Nebraska, July 24, 1950.)
(2) Gullicksen v Shadoan, 218 P. 2d 714.

Lowest responsible bidder

Local statutes often require the award of public contracts to be made to the "lowest responsible bidder." That term does not mean one who is only financially responsible, but also one who also possesses moral worth. It implies skill, judgment and integrity as well as sufficient financial resources. The duty of the awarding agency is judicial in its nature; that agency must investigate and consider the background of the bidder before making its award.

In the absence of a showing to the contrary, the courts will assume that the awarding agency exercised its discretion in an honest desire to award the contract to the lowest responsible bidder. "The courts have no right to sit in judgment upon questions of administrative discretion, or interfere with the conduct of municipal officials in the absence of illegality, fraud, collusion, corruption or bad faith."[1]

(1) Picone v City of New York, 176 Misc. 967, 29 N.Y.S. 2d 539 and numerous cases there cited.
Syracuse Intercepting Sewer Board v Fidelity & Deposit Co. of Maryland, 265 N.Y. 288, 174 N.E. 657.

Arbitration of disputes

Where a contract provides that all disputes arising out of the work shall be settled by arbitration and that the decision of the arbitrators shall be a condition precedent to the resort to any other remedy, proceeding or action, the contractor cannot maintain any action for extras or for damages until there has been an arbitration award.[1]

(1) Lenmar Const. Co. v New York Housing Authority, 100 N.Y.S. 2 d 321.

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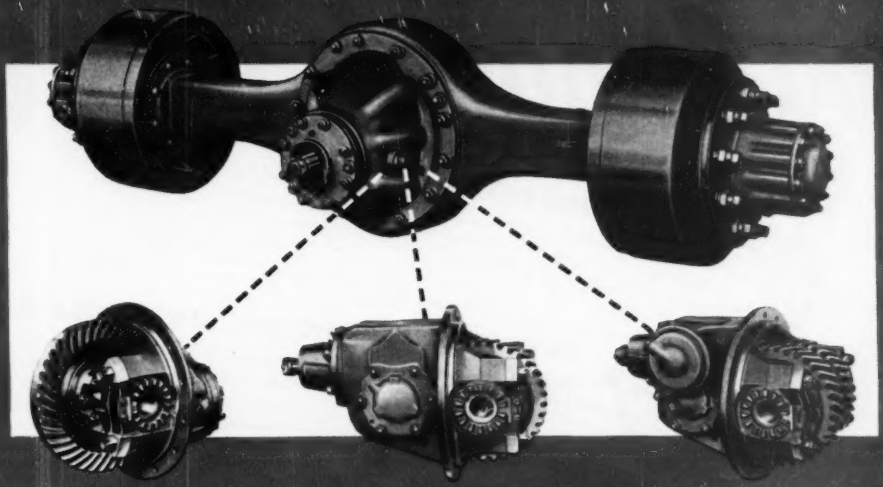

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READER COMMENT

Higher stress not favored

Sir: Use of 28,800-psi stress for American Society for Testing Materials A7 steel proposed in "Reader Comment" (ENR Mar. 1, p 46), which provides only a 15% margin with respect to the yield stress, cannot be regarded as an efficacious practice in saving metal at this time.

Extensively distributed official information concerning the blast resistance of standard steel-frame buildings and standard monolithic reinforced concrete buildings indicates greater safety for the latter, which in addition contain considerably less steel than a substandard steel-framed structure. Such construction is not justifiable, therefore, as a steel-saving proposition. It is also inconsistent with widely discussed principles in civil defense.

LOUIS BALOG
Consulting Engineer
Binghamton, N. Y.

Wanted: Grease-trap data

Sir: An article in the Feb. 8 issue of ENGINEERING NEWS-RECORD under the Education and Research department, titled "NYU researchers study scout-camp grease traps", interests me very much. I have found a similar condition occuring in residence grease traps.

During 16 years of public health experience I have used various sizes and shapes of kitchen grease traps in connection with rural and suburban sewage disposal systems. About 10 years ago we settled on a trap 1½ x 3 ft in area and having a depth below the outlet sufficient to give a liquid capacity of 50 gal. A nitrification field was laid of 4-in. farm drain up to 100 ft in length in gravel or cinders similar to a septic tank nitrification field. It was necessary to clean grease from this trap about once a year under average conditions.

About four years age we began to have the problem of excess water being disposed of from clothes washing machines which were usually located in the kitchen. We apparently settled this problem by increasing the length of drain field leading from the trap to 150 ft. For about two years now we have been receiving complaints of clogged nitrification fields connected to kitchen grease traps. In 95% of over 80 cases personally investigated, I found material in the trap to be an emulsion, instead of reasonably clear water with a grease layer on top. It is my opinion this condition arises from the use of synthetic detergents used in most current soap powders on the market at present. I would like to know if others have experienced this problem and what is being done to remedy the situation. We have tried grease traps up to 100 gal in capacity and the grease still does not separate.

I think the soap manufacturers should take a hand. They are giving us soaps which clean and sanitize more satisfactorily than any we've had to date, but some economically feasible method of disposing of wastes along with these soaps is necessary.

A. J. KIRBY
Crisp County Department of Health
Cordele, Ga.

Jacking pipe

Sir: The information on the 96-in. reinforced concrete pipe jacked 80 ft under Sheridan Drive, Tonawanda, N. Y., given in the article on p 36 of the Feb. 22 issue corroborates recommendations in the report "Jacked-in-Place Pipe Drainage" published by Highway Research Board in Bulletin No. 14, 1948. As a result of the analysis of available installations, for concrete pipe jacked in the method used at this location, the report recommends jacking pressure provision equal to 300 to 350 psf of imbedded surface.

For a 96-in. pipe with 9-in. walls, 80 ft of length totals 2,390 sq ft. The total available jacking pressure of 400 tons shows a resistance of 335 psf so that 80 ft was the expected limit of jacking.

The report also gives suggestions for maintaining line and for various methods of providing proper jack reactions. In the installation described, it would seem that the pipe should have been jacked from each side of the road, using the concrete conduit as a reaction. The sloping bank as an untimate reaction for the jacks was undoubtedly the cause of the timber planking springing, but even with a firmer reaction, the jacking capacity was insufficient for the 100 ft, or so, of expected penetration. Other recorded 96-in. concrete pipes installed by jacking were at Elmira, N. Y., in 1940, 69 ft long and at the Potomac Yard of the R. F. & P R. R., Va., in 1945, 132 ft long. Not enough consideration is given to jacking methods to avoid serious traffic disturbances in crossing main roads or runways.

JACOB FELD,
Consulting Engineer
New York, N. Y.

PRESSURE TREATMENT PAYS

• Wood exposed to moisture and air at normal temperatures *always* faces the hazard of decay—unless treated. Since a pressure treatment, selected according to the proposed use, multiplies wood service life many times, it's highly profitable. Write for Bulletin SW4 on pressure treatment.

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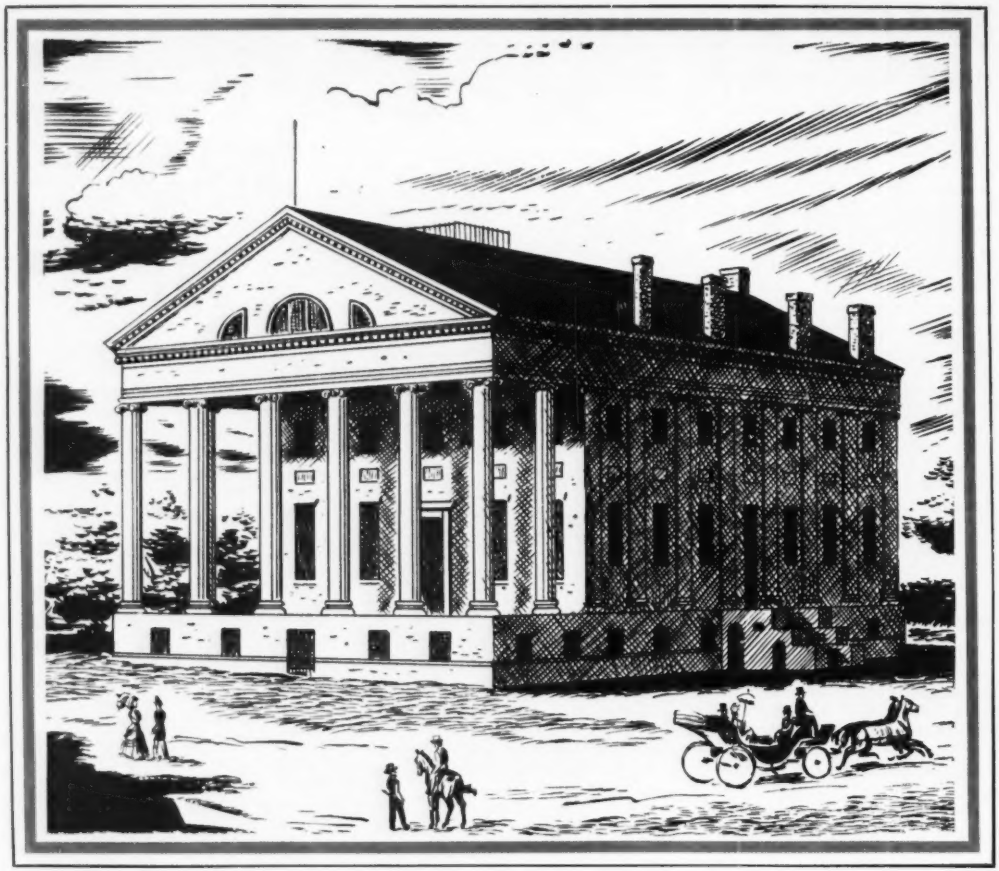

Richmond's State Capitol, completed in 1792, as it looked 100 years ago

Richmond, Virginia, has a cast iron water main in service that was installed well over a century ago. In those stage-coach days, *traffic shock* caused by heavy trucks and buses was, of course, undreamed of. There were no sewers and other underground conduits to cause soil disturbances and settlement. Yet this rugged old pipe had what it takes in shock-strength and beam-strength to meet unforeseen stresses. Strength, as well as effective resistance to corrosion, are prerequisites of long life in pipe to be laid under city streets. This is evidenced by the fact that cast iron water and gas mains, laid over a century ago, are still serving in the streets of more than 30 cities in the United States and Canada.

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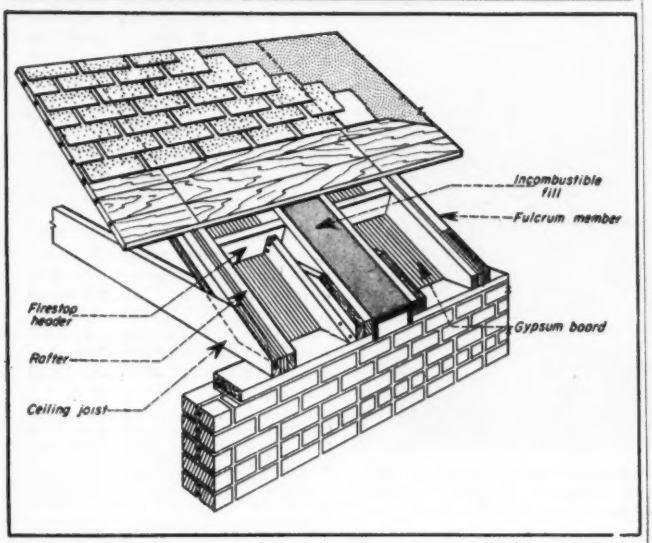

Fire-resistant roof construction for row houses

A method of constructing continuous fire-retardant roof decks that span two or more row houses separated by 2-hr masonry walls has been developed by the Engineering Committee of the Asphalt Roofing Industry Bureau, and approved by the Department of Public Works of the City of Baltimore, Md.

Advantages claimed for this type of construction are that it eliminates protruding parapets at party walls; permits the use of fire-resistant asphalt shingles; and it promotes economical construction.

The roof construction extends on both sides to include the second rafter from the party wall. The roof deck is designed to fall at or beyond this second rafter should fire cause it to collapse. This is accomplished by ending all roof boards over the center of the second rafter on each side of the party wall. A 2x2-in. fulcrum nailed to the second rafter facilitates failure along the rafter.

Space between the rafters is enclosed with two thicknesses of ½-in. gypsum board, separated by wire mesh The time-temperature rating of this construction is 1 hr when wire mesh is used; 45 min, without the mesh. The gypsum board between the first two rafters does not fall when the roof collapses, but remains in place to serve as a deflector to prevent flames jumping over the parapet wall to adjacent dwellings.

Water pipes replaced with minor lawn damage

Civic improvements in Miles City, Mont., called for paving 9 mi of city streets, including replacement of curbs and gutters. Prior to paving, however, city officials ordered the replacement of old rusted domestic water service connections with new flexible copper pipe.

Using a truck-mounted Bantam trench hoe, the contractor completed the job without digging long trenches. Here's what he did:

Two holes were dug exposing house service connections—one at the curb line; one adjacent to the house. Old pipe was disconnected and new flexible copper tubing (in rolls) was connected to it by a special temporary fitting. Street-end of the old pipe was hooked to a chain fastened on the middle of the trench-hoe stick, and pulled out with the Bantam's drag drum. The copper tubing was thus "threaded" through the old pipe cavity with only minor damage to the landscaping.

The holes were backfilled by a blade attached to the hoe, and puddled with water. Final leveling was accomplished by driving the rubber-tired Bantam back and forth over the fill. The work was performed by Youngbouer & Doeden, Miles City plumbing and sewer subcontractors.

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This powerful hammer combines simple design, compactness and long-time durability to give you greater operating economy. Piles go down faster, easier, and at less cost than you ever imagined. Remember, Super-Vulcan saves three important ways—on time, maintenance and motive power costs.

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METROPOLIS OF CANADA from the air, showing the business section and docks, the St. Lawrence River, and the south shore in the background. At right is the famous Victoria Bridge, first built in 1854-59 and reconstructed in 1898-99.—Photo Survey Corp. Ltd.

Industry, building boom in Montreal

Montreal, Canada's largest city and major seaport, is in the midst of its greatest industrial boom. Construction permits last year totaled $75,000,000, and $69,200,000 the year before. In the last two years close to 300 new industries have been established in the city and its environs. In so far as construction controls permit, Montreal expects to have as big a year in 1951 as in the last two years.

Municipal construction is mainly in new schools and hospitals, public buildings, waterworks and sewers. Montreal is considering the building of a rapid transit subway, and has recently taken over the street car and bus systems operated by private companies. About $5,000,000 is being spent on new schools by Protestant and Catholic school commissions, and almost $20,000,000 on three new hospitals and a nursing home by religious orders and the University of Montreal. A new $1,000,000 pumping station is being built by the city and $1,650,000 is being spent on water mains and sewers. A $3,500,000 labor office building is going up, as well as a $5,000,000 office building and warehouse for the provincial hydro-electric system.

Residential building, both apartments and single-family homes and duplexes has been a major construction activity in the last few years. Last year 12,000 new dwelling units were built and in 1949 a total of 10,000 units. Currently about $18,000,000 in residential building is going up, varying from apartment blocks to bungalows on the outskirts of the city.

Montreal is on an island dominated by Mount Royal, in the center of the city. It was one of the earliest settlements in Canada, the site having been discovered by Jacques Cartier in 1535. It has always been a seaport, although about a 1,000 miles inland on the St. Lawrence River from the Atlantic Ocean. Toll and free vehicular bridges and railroad bridges connect the city with the mainland. Its docks can handle the largest ocean liners and freighters. During the summer months it is Canada's main seaport, but the St. Lawrence River is frozen over most of the winter.

Because of its seaport facilities and proximity to the sources of cheap hydro-electric power, Montreal has become a big manufacturing city. In the postwar years industrial expansion has been particularly rapid. Branch plants of U. S., British and many other European companies have been opened in Montreal and vicinity in recent years. Among bigger industrial plants now in process of construction are a $1,000,000 extension to the Canadian National Railways car shops, several $500,000 food processing plants, a $2,000,000 addition to an aircraft plant making jet fighters, a $5,000,000 ethylene glycol plant, and a $2,000,000 paper box factory.

The Canadian National Railways is putting up a $1,000,000 office building and $4,500,000 on rebuilding its Bonaventure freight yards. A $1,000,000 exhibition building is under construction. A pipeline between Montreal and Portland, Me., costing $15,000,000 is now under way. A number of warehouses and office buildings costing close to $750,000 each are being erected. A $700,000 orphanage is being built by a religious order, and the Canadian Pacific Railway is spending $12,000,000.

Montreal's population, including its suburbs, is now estimated at well over 1,500,000, making it the largest city in Canada. The population is predominantly French-speaking, though Montreal has a larger English-speaking population than all the rest of Quebec province when considered as a unit.

One-way streets—Conversion of two key downtown and two North End streets of Seattle, Wash., into one-way thoroughfares has been recommended by Mayor William F. Devin, following a program suggested by City Engineer R. W. Finke. Seattle now has only two one-way streets of any consequence, both just north of the central business district, taking traffic to and from the Pacific highway. Under the new plan, Second and Fourth avenues would carry traffic one way through the central business district. In the North End, Roosevelt Way long has been congested. It is only four lanes wide and two lanes usually are filled with parked cars. Efforts of the city engineering department to ban parking on the street have been successfully opposed by owners of business property. Widening has been proposed but would be extremely expensive, because of high condemnation costs. Under the new plan, Roosevelt Way would carry traffic only southbound while nearby 11th Ave., N.E., would be widened to carry northbound traffic.

In Minneapolis, Minn., five pairs of streets are recommended as oneway thoroughfares for the near future by Ralph W. Sprungman, city traffic engineer. The five pairs are: Marquette-Second Avenue S; Portland-Park Avenues; Tenth St.-Eleventh St.; Seventh St.-Eighth St.; and Third St.- Fourth St.

Economical operation—In 1950 operation of the sewage disposal plant of Minneapolis-St. Paul, Minn., cost those twin cities nearly $283,000 less than had been anticipated, according to the recent annual report. Saving was largely in chemicals. Handled at the plant last year were 41,495 million gallons of sewage.

NEW PHOTOGRAPHIC MATERIALS...
NEW DRAFTING SHORT CUTS

Eliminate Costly Retracing

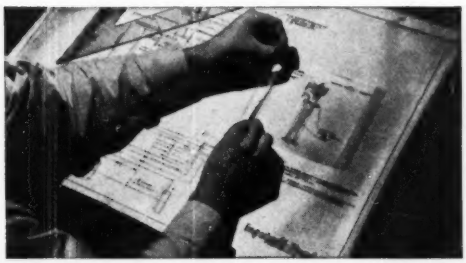
at INGERSOLL-RAND
Phillipsburg, N. J.

"Ink quality" file copies of pencil drawings are produced with Kodagraph Autopositive Cloth

Instead of making expensive "ink on cloth" tracings of its original drawings, Ingersoll-Rand simply reproduces them on Kodagraph Autopositive Cloth. This new photographic material produces positive copies *directly* (like Kodagraph Autopositive Paper and Film) . . . without the negative step . . . without darkroom handling. No special equipment is required, either: a photocopy machine is used for the exposure operation . . . standard photographic solutions for development. *Result:* intermediates that have the sharpness, the sparkle of new ink tracings . . . with non-smudging, dense photographic black lines on a durable white cloth base.

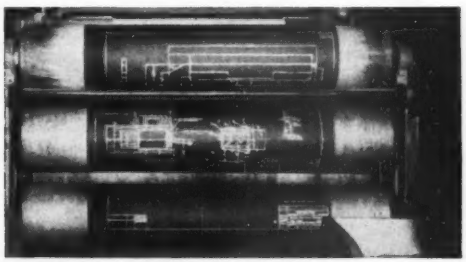
Old, soiled, or damaged drawings are restored with Kodagraph Autopositive Paper

When such drawings are taken from the files, the call is for Kodagraph Autopositive Paper—to eliminate hours of expensive retracing time. This low-cost, high-contrast photographic material increases line density . . . cleans up backgrounds . . . in many cases delivers serviceable intermediates that require no handwork at all. Drawings in very poor condition are restored by Ingersoll-Rand in the following manner: after an "Autopositive" is made, stains, creases, and other unwanted elements are removed with eradicator fluid or razor blade. Then, the print is used to produce a second "Autopositive," which is touched up with pencil if necessary.



Standard units are added to new drawings with Kodagraph Autopositive Film

Among the many ingenious drafting short cuts developed by Ingersoll-Rand is the use of Kodagraph Autopositive Film overlays made from standard-component drawings. These transparencies are kept on file . . . and taped to new drawings whenever necessary. Following this, the composite is reproduced on Autopositive Paper. *Result:* a photographic intermediate of uniform line density . . . plus important savings in drafting time.

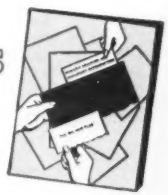


Additional advantages of using Kodagraph Autopositive intermediates

Sharper, cleaner blueprints are produced—at uniform, practical speeds—because Ingersoll-Rand makes them from "Autopositives" instead of its perishable original drawings. This way—there's far less chance of "reading errors" in the shop. And valuable originals are protected against machine wear and tear . . . constant handling; are kept safe in the files available for reference and revisions only.

Kodagraph Autopositive Materials

"The Big New Plus" in engineering drawing reproduction



MAIL COUPON FOR FREE BOOKLET

Learn in detail how you can use Kodagraph Autopositive Paper, Cloth, and Film -- the revolutionary products which you, or your local blueprinter, can process quickly, economically. *Write today* for a free copy of "Modern Document and Drawing Reproduction."

EASTMAN KODAK COMPANY 67
Industrial Photographic Division
Rochester 4, N. Y.

Gentlemen: Please send me a copy of your illustrated booklet giving all the facts on Kodagraph Autopositive Materials.

Name_____ Position_____
(please print)
Company_____ Street_____
City_____ State_____

Kodak
TRADE-MARK

97% OF LORAIN OWNERS ARE WITHIN 8 HRS. BY CAR OR 2 HRS. BY PLANE OF A THEW-LORAIN PARTS STOCK

NEVER AN "ORPHAN"—AT ANY AGE

Records show that for all Distributor's parts orders received, covering *any and all models* of Thew-Lorains, regardless of age, 81% of such parts are shipped promptly from the Parts Warehouse bins. . . . This is a remarkable record when it is considered that it includes orders for parts on machines 20, 25 and 30 years old. For example, recent shipments covered parts for a Type-00 Serial No. 2948 shipped in 1926; for a Lorain-75 Serial No. 3280 shipped in 1927; for a Universal Crane Serial No. 855 shipped in 1928. Frequently, to take care of these obsolete parts, special effort is required to run through a *single* piece . . . but it's all part of our policy that you can *always* get parts for *any* machine built by Thew-Lorain.

YOUR THEW LORAIN DISTRIBUTOR SPEEDS PARTS TO YOUR JOB

MONEY-SAVING PARTS "PACKAGES"

Among the parts your Thew-Lorain Distributor has available are a number of "package" items, consisting of commonly used parts. These "packages" contain all related and required parts for a replacement or change-over. Boxed as a unit, these "packages" are offered Lorain owners at *special money-saving prices.* Another *Service*—and another *Saving* you get when doing business with your Thew-Lorain Distributor.

IMAGINE!—**never** being **more** than 8 hours away from a source of Lorain parts... and in most areas east of the Mississippi, it's **never** over 2 hours. That's the kind of Parts Service offered you by the nation-wide organization of Thew-Lorain Distributors. Most of these Distributors have the parts in bins waiting for you. Records prove that **97% of Lorain owners** in the United States are **never more** than 8 hours by car from a Distributor's Parts Stock capable of filling **at least 70%** of their requirements right off the shelf.... And this percentage would be much higher if it were not necessary to furnish obsolete parts for machines often 25 to 30 years old. Here's just another important way Thew-Lorain Distributors back up your machine and keep it on the job producing profits for you.

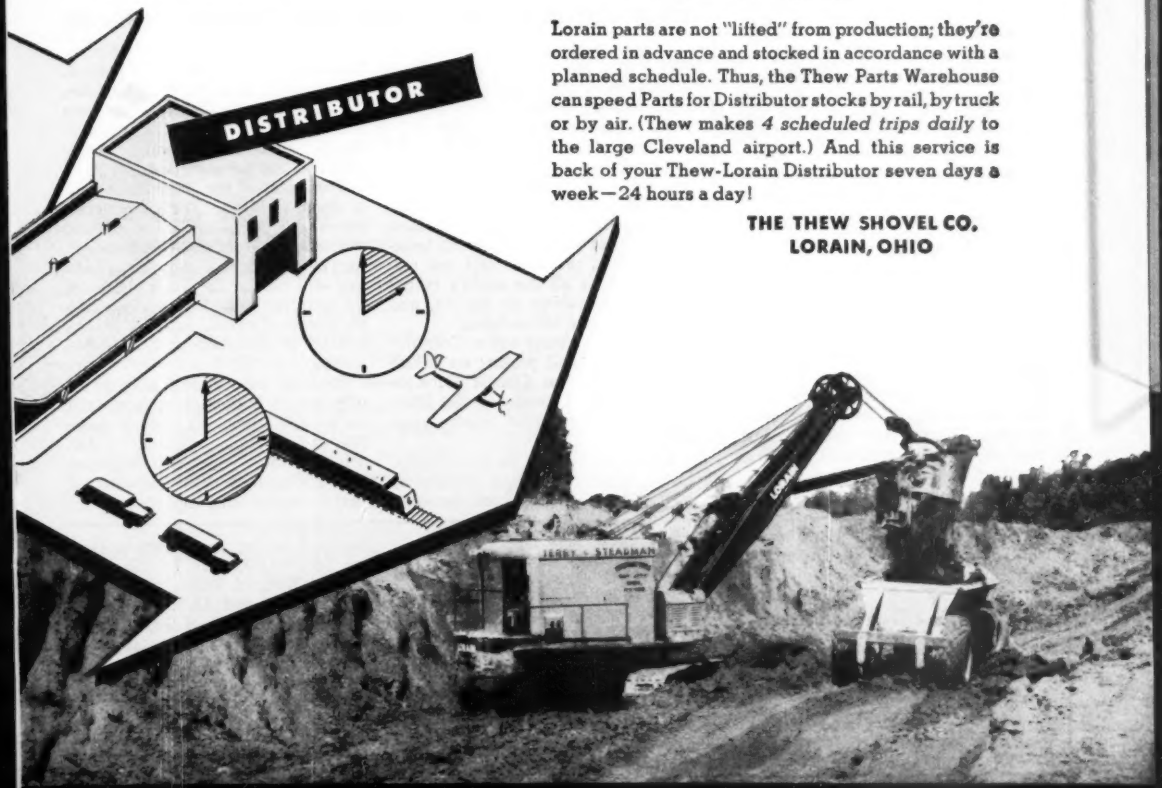
HOW WE BACK UP YOUR DISTRIBUTOR...

There's sound planning behind the reasons that enable your Thew-Lorain Distributor to give you such excellent Parts Service. It comes from the Thew policy that "Parts" are not a "side-line" or a "necessary evil". Instead, Thew has set up a separate "business" to run its Parts Division.

It has its *own* location
(Elyria, Ohio—10 minutes from Lorain)
It has its *own* buildings
It operates its *own* machine shop
It maintains its *own* warehouse
It is directed by its *own* management
It does its *own* purchasing
It makes its *own* inspection
It handles its *own* shipping

Lorain parts are not "lifted" from production; they're ordered in advance and stocked in accordance with a planned schedule. Thus, the Thew Parts Warehouse can speed Parts for Distributor stocks by rail, by truck or by air. (Thew makes *4 scheduled trips daily* to the large Cleveland airport.) And this service is back of your Thew-Lorain Distributor seven days a week—24 hours a day!

THE THEW SHOVEL CO.
LORAIN, OHIO



THEW-LORAIN

COMMENT
from the
BUTLER ENGINEER

April, 1951

Of Several Things—Including *FIRE*

What's a fireproof building? Here's the best definition I've heard: "One that burns with a bright blue flame." . . . How fireproof is any Ready Mixed Concrete Plant? Or Roadbuilder's Plant? The answer's in the form of another question. What materials or equipment in the plant could cause a flash fire? A gas engine perhaps. Gasoline or oil in storage. Wood platforms. Wood siding . . . Think it over, because when you have a sudden 4-11 roarer concentrated against loaded structural steel—brother, get fire insurance—beforehand! I've seen it happen.

•

Butler Bin families are prolific. Wait a minute. What I mean is that people who install Butler Plants order more—strictly Butler—when their operations expand. Quintuplets aren't unusual. Triplets are common. Septuplets quite often occur. Names of the happy families on request. No room to print 'em. Two things, however, are pretty evident. The profitable efficiency of Butler Engineered Design *leads to expansion. And there's no net worth-control for one who joins the Butler Bin family.*

•

I attended the Ready Mixed Convention at New Orleans. Ready mixed concrete, I'm speaking of—not the already-mixed Floras and fauns around the bars . . . A woman's ready-to-wear shop next to the Roosevelt displayed bras and panties. That's not unusual, but worked prominently into the fabric was the silhouette of a hand. Masculine, if I'm any judge. Come to think of it, how unusual is that? I really wouldn't know. I'm a structural engineer—but I confine myself to steel.

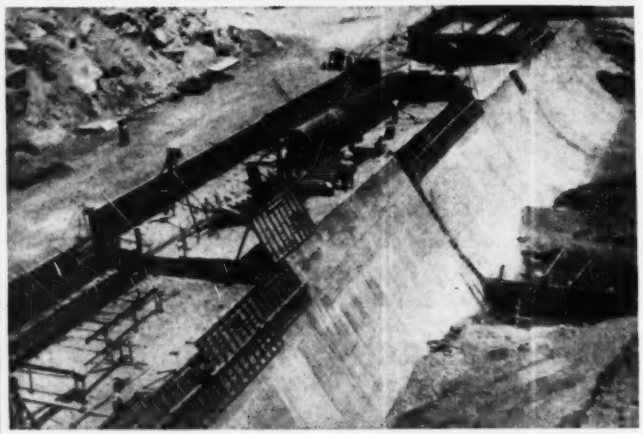
•

I'll be back 'long about June.

The Butler Engineer

BUTLER BIN COMPANY
WAUKESHA, WISCONSIN

DEVELOPMENTS ABROAD



CEYLONESE IRRIGATION—The biggest agricultural scheme in Ceylon (population 7,000,000) is the Gal Oya multipurpose dam project which will provide 700,000 ac ft of water for irrigation. It is hoped to irrigate 100,000 acres which are now jungle lands, and to improve the irrigation of 30,000 acres already under cultivation. Shown is the spillway section of the dam in process of construction.
—Eastern Pubs. photo.

Economic plan to aid millions of Asians

About one-fourth of the human race who live in an area vital to the democratic world, are being considered in a far-reaching 6-year scheme for economic development.

Named the Colombo Plan—after the capital of Ceylon where the idea was born at a meeting of British Commonwealth representatives—the scheme covers South and South East Asia, an area which, besides its teeming millions, produces vital raw materials, almost all the world's rubber and jute, two-thirds of the tin, and one-third of the oils and fats.

The latest meeting was in Colombo last Feb. 13, and present on behalf of the U. S. was Donald D. Kennedy, Deputy Director of the State Department's office of South Asian affairs.

Countries already in are Ceylon, India, Pakistan, Malaya, Singapore, North Borneo, Brunei and Sarawak. Invited to full participation are Burma, Indo-China, Indonesia and Thailand. Co-operators are Britain, Australia, Canada and New Zealand. The aim is to transform the area into one in which poverty and economic backwardness can be overcome.

Total cost of the six years is seen as about $5 billion. The various commonwealth governments are studying the extent of financial help which they can afford, and, of course, a large part will fall on the governments of the countries to be helped. Including the release of sterling balances, Britain is likely to contribute well over $840 million.

Some of the expected tangible results are 13 million acres more land under cultivation; six million more tons of food grains produced; 13 million acres more land under irrigation; and 1.1 million more kilowatts of electricity-generating capacity.

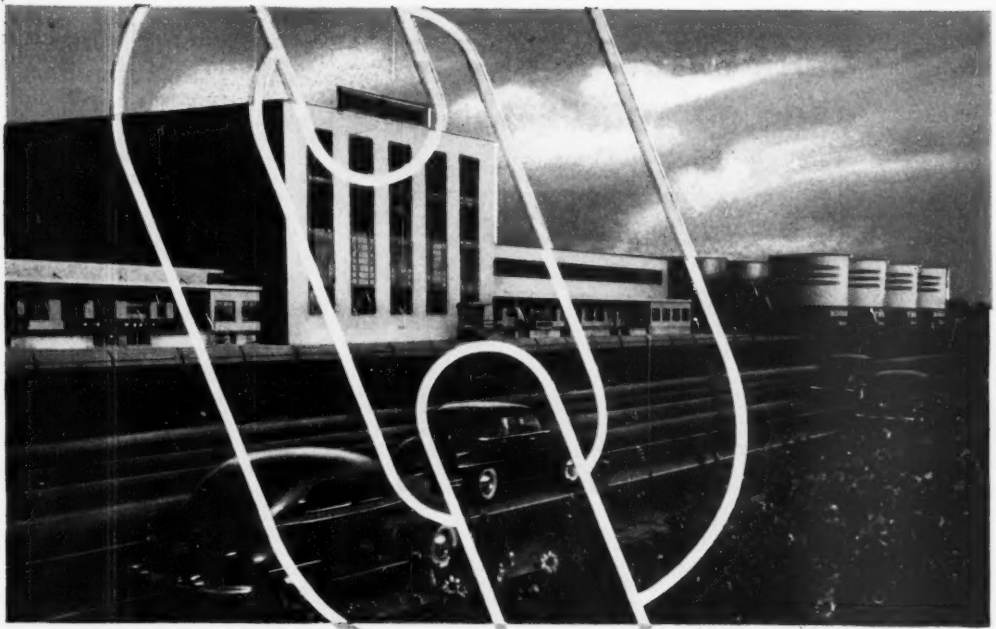
Foreign briefs

For European industry—Marshall Plan industrial projects—the backbone of Western Europe's current rearmament effort—have received approval for $549,000,000 worth of U. S. dollars aid in the last three years. ECA dollars are used to finance the cost of needed American equipment and engineering services.

Helping South Africa—Power and transport are the main beneficiaries of the $80,000,000 loan by the International Bank of Reconstruction and Development and U. S. commercial banks to the Union of South Africa. The International Bank has also indicated its willingness, in principle, to entertain further applications for loans for acceptable production projects.

Banana pier—The Colombian government has contracted with the Fred-

(Continued on page 60)



Cities Service Terminal & Compounding plant, Chicago, Illinois

Newest link of PROGRESS

NOW!...The *newest...finest...* *most modern* plant for compounding and packaging lubricating oils

Month by month you see the proof piling up of still more Cities Service growth... strength . . . progressiveness. Now the latest Cities Service facilities have been added in Chicago's Cicero district. Here a completely modern 25-million-gallon plant is in full operation today, to serve you with lubricants of characteristic Cities Service quality.

The size of this complete plant...its rail and water transport advantages...and the excellence of its output signify the progress Cities Service is attaining throughout its marketing area. Cities Service has been progressive and will remain so, always striving to provide its dealers...its customers...with the finest petroleum products made.

CITIES SERVICE

Quick answer to a $300,000,000 question

3 CUBIC YARD MIXER
GUARANTEED TO HOLD, MIX AND AGITATE ITS RATED CAPACITIES AND CERTIFIED TO COMPLY WITH TRUCK MIXER MANUFACTURERS BUREAU STANDARDS AS APPROVED BY N.R.M.C.A.
4 CUBIC YARD AGITATOR
N.R.M.C.A.

How can you know whether the truck mixers that serve your jobs have the accuracy of water control, design and speed of drum and full amount of free mixing space needed to properly mix the concrete they deliver?

You simply look for this standard rating plate.

The Bureau rating plate is available to all manufacturers who meet its quality standards and requirements.

To the construction industry, which uses more than $300,000,000 worth of ready-mixed concrete a year, this rating plate gives indispensable protection against questionable concrete from non-standard truck mixers. Insist on it, when you approve or buy concrete ready-mixed.

Truck Mixer Manufacturers Bureau

BLAW-KNOX DIVISION, Pittsburgh, Pa. · CHAIN BELT COMPANY, Milwaukee, Wis. · CONCRETE TRANSPORT MIXER CO., St. Louis, Mo. · THE JAEGER MACHINE COMPANY, Columbus, Ohio · THE T. L. SMITH COMPANY, Milwaukee, Wis. · WORTHINGTON PUMP & MACHINERY CORP., Dunellen, N. J.

Diamond Core

Drilling

CORE BORINGS for Foundations, Dams, Bridges and all Heavy Structures
GROUT HOLES

Tinney Drilling Co.
Grafton, W. Va.

The BELMONT IRON WORKS

Engineers — Fabricators — Erectors
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STRUCTURAL STEEL
BUILDINGS & BRIDGES
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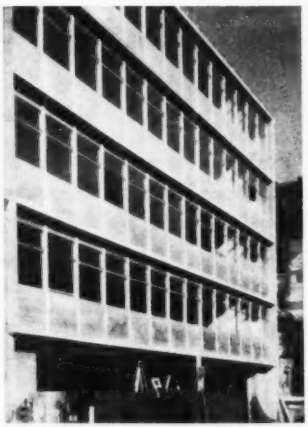
PHILADELPHIA — Main Office, Philadelphia 48, Pa.
AISC
ROYERSFORD — New York Office 44 Whitehall St., N. Y. 4, N. Y.

erick Snare Corp for construction of a modern pier for the port of Santa Marta, famous for banana export. It will cost about $3,000,000. They are to build a Magdalena-Santander highway for about $5,000,000.

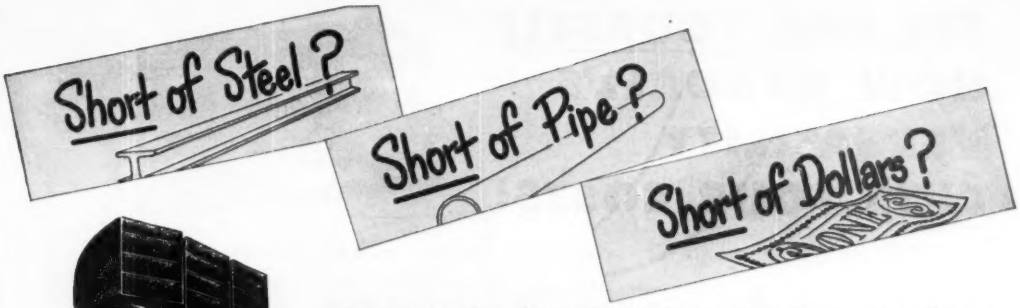
Singapore developments—The government of Singapore has plans for expenditure of $180,000,000 to build an international airport and for a housing scheme, wharf extensions, additional gas and electric facilities and water and sewer extensions.

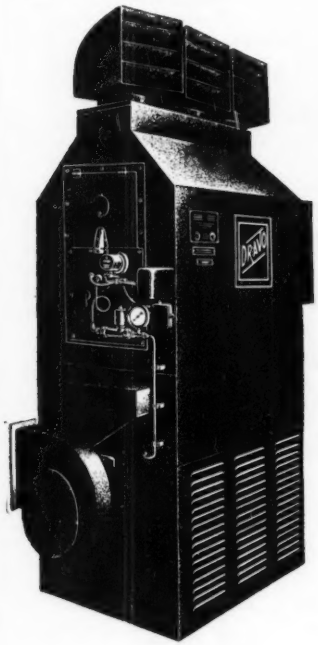
Formosan health centers—Every community on Formosa will soon have its own health center as the result of a joint Chinese-American self-help program launched by the ECA, which is providing only medical supplies and technical assistance.

Power for Cyprus—The first stage of the giant electric power station in Cyprus is almost complete. The station is part of a central electrification scheme, the biggest single project ever carried out by the British since they took over the island in 1878. When complete, early in 1952, the station will generate 70,000 kw of electricity and provide many thousand more Cypriots with current in their homes.



ALUMINUM PANELS—Having read about the stainless steel panels used in construction of the 525 William Penn Place building in Pittsburgh (ENR Feb. 8, page 29) Michel Bloch, a Parisian engineer, sent this picture of aluminum panels used in building a 5-story office building in the Rue Lapérouse, Paris. The panels designed and manufactured by Les Ateliers Jean Prouvè, of Nancy, are of 2-faced insulated aluminum without any steel. Each panel, 10 ft high and 4 ft 8 in. wide, weighs only 240 lbs, glass included. A 3-man crew enclosed both faces of the building in four days.





DRAVO HEATERS SAVE STEEL,

MONEY—FUEL—and MAN HOURS

The steel needed for a heating system *can* be slashed from 50% to 70% for the representative open-space industrial structure shown below . . . by using the direct-fired warm air heating method with Dravo "Counterflo" Heaters! This conservation of steel, vitally important today, adds another saving to the long list of economies in money, fuel and labor effected by this heating method.

The chart below gives the detailed comparative story. Every system is equivalent in Btu output. Steel requirements for the 13 methods have been carefully and conservatively calculated.

You will see that Dravo Heaters not only take LESS steel in each fuel classification . . . but that the HIGHEST steel requirement in a Dravo installation is *almost 50% less* than the LOWEST steel requirement in *any other* system!

Look at the contrast in *pipe* required! Jobs now held up by slow pipe deliveries can MOVE . . . if Dravo heaters are used!

Dravo "Counterflo" Heaters can expedite installation jobs for you! And the steel and pipe savings are just two of the many reasons why more and more "Counterflo" Heaters are being used in all types of structures.

DRAVO HEATERS HAVE EARNED HIGHEST INDUSTRIAL ACCEPTANCE BECAUSE THEY OFFER—

- **LOW FIRST COST . . . Users report 50% to 60% savings**
- **WORKING-ZONE WARMTH . . . Units heat 4,000 to 20,000 sq. ft.**
- **NO FUEL WORRIES . . . Burn oil or gas . . . readily converted**
- **AUTOMATICALLY CONTROLLED . . . On-off or modulating controls**
- **LOW OPERATING COST . . . 80-85% efficiency**
- **EASY INSTALLATION . . . Fuel, electric and exhaust connections only**
- **LONG LIFE—LOW MAINTENANCE . . . Stainless Steel combustion chamber**
- **TESTED—APPROVED . . . AGA and/or UL seal**
- **AVAILABLE . . . Immediate delivery, no delays**

Each heating system compared below was sized to make up a calculated 12,000,000 Btu heat loss in this representative industrial building.

WRITE TODAY FOR BULLETIN KL-526-243

TOTAL METAL REQUIREMENTS FOR VARIOUS HEATING SYSTEMS WITH IDENTICAL 12,000,000 Btu LOAD

COMPONENT	GAS FIRED					OIL FIRED					COAL FIRED		
	DRAVO WARM AIR	HIGH PRESSURE CONVENTIONAL WATER TUBE BOILER	HIGH PRESSURE PACKAGED STEAM GENERATOR	LOW PRESSURE CONVENTIONAL WATER TUBE BOILER	LOW PRESSURE PACKAGED STEAM GENERATOR	DRAVO WARM AIR	HIGH PRESSURE CONVENTIONAL WATER TUBE BOILER	HIGH PRESSURE PACKAGED STEAM GENERATOR	LOW PRESSURE CONVENTIONAL WATER TUBE BOILER	LOW PRESSURE PACKAGED STEAM GENERATOR	DRAVO WARM AIR	HIGH PRESSURE CONVENTIONAL WATER TUBE BOILER	LOW PRESSURE CONVENTIONAL WATER TUBE BOILER
BASIC HEAT GENERATORS	26,400	38,000	62,000	38,000	62,000	26,400	38,000	62,000	38,000	62,000	27,450	38,000	38,000
PIPING—Oil—Steam Boiler Room—Gas	9,096	15,490	15,490	35,308	35,308	4,352	15,790	15,790	35,608	35,608		14,990	34,808
TANKS—Oil—Blow-off Condensate		3,500	1,500	1,500	1,500	13,000	16,500	14,500	14,500	14,500		3,500	1,500
UNIT HEATERS Including Traps & Starters		21,240	21,240	21,240	21,240		21,240	21,240	21,240	21,240		21,240	21,240
STACKS & BREECHING	1,200	4,000	400	4,000	400	1,200	4,000	400	4,000	400	1,200	4,000	4,000
PUMPS—Fuel Oil Auxiliary Oil—Boiler Feed		1,000	1,000	1,000	1,000	400	1,400	1,000	1,400	1,000		1,000	1,000
STOKERS & FANS—including Dust Collectors Fuel Oil Preheaters							2,000		2,000		23,850	15,000	15,000
STRUCTURAL STEEL Boiler House Foundation Reinforcing		7,000	2,000	7,000			7,000	2,000	7,000			7,000	7,000
TONS of STEEL REQUIRED	DRAVO **18**	**45**	**52**	**54**	**61**	DRAVO **23**	**53**	**58**	**62**	**67**	DRAVO **26**	**52**	**61**

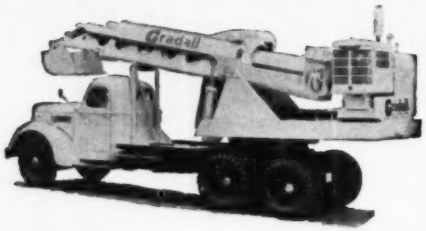
DRAVO CORPORATION

HEATING DEPARTMENT, DRAVO BUILDING, PITTSBURGH 22, PA.

Sales Representatives in Principal Cities

Manufactured and sold in Canada by Marine Industries, Ltd., Sorel, Quebec

SEE FOR YOURSELF HOW GRADALL'S VERSATILITY CUTS YOUR COSTS!



One machine now does the work of many!

Trenching, excavating, ditch digging, grading, backfilling, pavement removal — whatever the job — Gradall handles it simply and speedily. And it practically eliminates costly hand labor.

But be your own judge. Call the Gradall Distributor nearest you to arrange a field demonstration!

There's a Gradall Distributor near you!

UNITED STATES

ARIZONA
Phoenix
Arizona Equipment Sales, Inc.
2750 Grand Avenue

ALABAMA
Birmingham
Tractor and Equipment Co.
4401 First Avenue North
Montgomery
Ray-Brooks Machinery Co., Inc.
101 Chandler Street

CALIFORNIA
Los Angeles
Brown-Bevis Equipment Co.
4900 Santa Fe Avenue
San Francisco
Contractors Machinery Company
1401 Illinois Street

FLORIDA
Jacksonville
Florida-Georgia Tractor Co.
2806 West Beaver Street
Lakeland
Florida-Georgia Tractor Co.
2415 State Road
Miami
Florida-Georgia Tractor Co.
3139 North Miami Avenue
Tallahassee
Florida-Georgia Tractor Co.
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Tri-State, Inc.
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Bogie Equipment Company
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McClung-Logan Equip. Co., Inc.
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Telford Equipment Company
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MINNESOTA
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Mississippi Road Supply Co.
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Western Machinery & Engine Co.
5075 Manchester Street

MONTANA
Billings
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Columbia Equipment Company
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Philadelphia
Service Supply Corporation
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Conte Equipment Corporation
Brushton Ave. at Thomas Blvd.

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Columbia
Southern Equipment Sales Co.
P. O. Box 328—Five Points Sta.

TENNESSEE
Chattanooga
Power Equipment Company
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Knoxville
Power Equipment Company
1430 Island Home Avenue, S.E.
Memphis
Road Builders Equipment Co.
Calhoun, East of Third
Nashville
Industrial Trac. & Equip. Co. Inc.
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Hi-Way Machinery Company
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El Paso
N. C. Ribble Company
Houston
Hi-Way Equipment Co., Inc.
953 McCarty Drive
San Antonio
Hi-Way Machinery Company
401-9 South Main Avenue

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MEN AND JOBS

Grant Bloodgood, center, Bureau of Reclamation chief construction engineer, confers with George Atkinson, president of the Guy F. Atkinson Co., San Francisco, left, and A. S. Horner, president, Horner Construction Co., Denver, Colo., during a recess at the Bureau of Reclamation's second annual Construction Engineers' Conference held recently at the Denver Federal Center.

New Appointments

Corps of Engineers

Lieut. Col. Wm. Roper, area engineer, Denver, Colo.
Lieut. Col. O. J. Pickard, plans and training officer, 6th Armored Div. Fort Leonard Wood, Mo.
Col. Wm. C. Ready, deputy div. engineer, North Atlantic Div.
G. E. McWhite, Jr. and L. D. Stephenson, Wilmington, N. C., district.
Percy F. Wendell, Wilmington, N. C., district office
Maj. E. B. Campbell, action dist. engineer, St. Louis, Mo., office.
Capt. W. S. Mortimer, exec. officer, Nashville Dist.
Lt. Col. E. H. Dillon, Armed Forces Staff College, Norfolk Va.
K. M. Pattee, chief, supply and procurement, New England div.

Municipal and County

Francis J. Lammer, exec. dir., Redevelopment Authority, Philadelphia, Pa.
Julian Hinds, part-time engineer for the United Water Conservation dist., Santa Paula, Calif.
Benjamin C. Seal, city engineer, Sheboygan, Wis.
C. E. Harness, city sanitary engineer, Denver, Colo.
A. G. Davis, engineer, Landel, Mich., metropolitan district.
Ira H. McCauley, deputy dir. of public service, Columbus, Ohio.
Theodore Pyle, city mgr., Rehoboth Beach, Del.
Miss Hazel I. Quick, member of City Plan Commission, Detroit, Mich.
Wm. J. Hess, bldg. inspector, Sacramento County, Calif.
G. M. Minturn, city mgr., Hanford, Calif.
F. M. Johnson, acting city engineer, Modesto, Calif.
R. L. Fox, consulting engineer Bethlehem, Pa., Authority
R. W. DeWeese, resident engineer, master plan for Maumee Watershed Conservancy Dist., Ohio.
F. B. D. Arnold, Middlesex County engineer, Picton, Ont.
R. B. Riddle, city mgr., Paris, Tex.
George J. Coogan, sanitary engineer, Boston south metropolitan dist., Mass. Dept. of Public Health.

Bureau of Reclamation

Marshall Jones, dist. Mgr., Sacramento Valley, dist.
James K. Carr, to the Washington, D.C., office.
R. L. Davidson, project mgr., Riverton project, Wyoming.

Government agencies

Clarence W. Farrier, consultant, Housing and Home Finance Agency on conservation of building materials and manpower.
J. A. Jones, chief engineer, construction and projects div., Central Mortgage and Housing Corp., Ottawa, Ont.
T. B. Pickersgill, regional supervisor in British Columbia.

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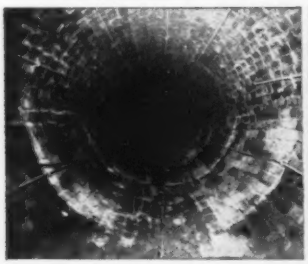

These pictures show how we are rebuilding nearly four miles of combination sanitary and storm sewers at Bloomington, Illinois by lining them with mesh reinforced "GUNITE."

Erosion of mortar joints and dislodged bricks made many sections of these 65 year old sewers both dangerous and inefficient. The new "GUNITE" linings will restore them to greater than original strength and result in many more decades of useful service at a fraction of the cost of new sewers.

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MANUFACTURERS OF THE CEMENT GUN

L. G. Mohr, production div, AEC, Washington, D. C.

Joe B. Sanders, chief of the town engineering branch, Los Alamos, N. M.

Forrest Varney, consulting engineer, ECA, Athens, Greece.

John K. Chattey, field party chief for Nicaragua for the Institute of Inter-American Affairs.

Herman G. Baity, Chapel Hill, N. C., has returned from a 3-months stay in Europe with the World Health Organization.

John L. Fraley, Cherryville, N. C., consultant to head of the Defense Transportation Administration.

Ralph P. Johnson, mgr. AEC field office, Las Vegas, Nev.

Rear Admiral A. D. Alexis, director Atlantic Div., Bureau of Yards and Docks, New York City.

Highway departments

Eugene J. White, dist. engineer Alaska Road Commission, Anchorage.

L. R. Stoltz, acting engineer, Div. 4, Ohio Highway Dept.

A. S. Taylor, engineer supt., Gratiot County, Mich.

J. I. Cahalan, div. engineer, New Castle County, Del.

E. G. Johnson, chief engineer of the Utah State Road Commission.

James B. Bice, Kent County division engineer, Delaware State Highway Department.

Paul H. Gates, commissioner of highways, Vermont.

Harry F. Hart, right-of-way engineer, Delaware State Highway Dept., and Ernest A. Davidson, construction engineer.

C. A. Stoldt, director of highways, Oklahoma.

Lewis E. Akers, secondary road engineer, Virginia Dept. of Highways.

Business changes

Richard Wells of Newton, N. C., has sold the Wells Construction Co. to work on air bases in North Africa.

P. & H. Construction Co. is being dissolved by partners A. J. Harvick and N. H. Plunkett. The latter will continue at Long Beach, Calif., under the name of North H. Plunkett & Co.

Sandlass Wieman & Associates have changed their name to Rummell, Klepper & Kahl, engineers, 1021 Calvert St., Baltimore 2, Md.

Damon Runyon, consulting engineer, has moved his offices to 1111 Stout Street, Denver, Colo.

Retirements

Geo. C. Hanson, Calif. Div. of Highways, 39 years.

L. V. Degnan, San Francisco public utilities engineering staff, 30 years.

O. G. Knecht, chief bldg. inspector, San Diego, Calif., 30 years.

R. C. O'Keefe, exec. vice-pres., Gen'l Contracting Employers Assn., Buffalo, N. Y., 25 years.

L. W. Stocker, senior civil engineer, San Francisco public utilities, 43 years.

Wm. R. Hill, partner, Parker & Hill, Seattle, Wash., 42 years.

Ingolf Erdal, Hazelet & Erdal, consulting engineers, Cincinnati, Chicago and Louisville.

Fred Kaline, senior engineer, Inglewood, Calif., 25 years.

Resignations

David M. Walker, exec. dir. Redevelopment Authority, Philadelphia, Pa., to become State Sec'y. of Labor and Industry.

C. R. McAnlis, asst. city engineer, Fort Wayne, Ind., to be business manager of the First Presbyterian Church there.

R. B. Sims, engineer Bureau of Reclamation, Denver, Colo., to go with Stearns-Roger Mfg. Co., Denver.

Carlton L. Nelson, Jr., Baxter, Nelson & Woodman, civil and sanitary engineer, Crystal Lake, Ill.

Henry Traxler, city mgr. and engineer, Janesville, Wis.

W. B. Smith city engineer, San Gabriel, Calif., to be chief engineer of the Riverside, Calif., Flood Control and Water Conservation Dist.

James Bookedis, supt. sanitation plant, Indianapolis, Ind., to become lieutenant colonel in the Army.

W. W. Behrens, chief engineer, Pennsylvania Public School Bldg. Authority, to become deputy Secretary of Commerce for the state.

R. A. Helmer, research engineer, Oklahoma state highway dept., to be chief engineer, Standard Testing Laboratories, Oklahoma City.

Honors

Frank A. Kittredge, chief engineer, National Park Service, silver Medal of the American Scenic and Historical Preservation Society.

John S. Elliott, Fort Worth Tex., Department of Commerce medal and citation.

Marion C. Nichols, "Engineer of the Year" in Fort Worth, Tex.

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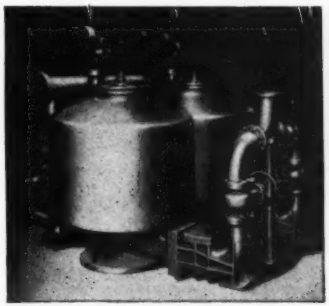

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√ no screens or shredders -- no repulsive cleaning job

For 75 years, in hundreds of municipal installations around the world, Shone Pneumatic Ejectors have been a symbol of utter dependability.

You may have heard the amazing story of the Shone Ejector sealed in its pit for more than 20 years—never inspected because it was not listed among mechanical equipment; rediscovered when alteration work opened the pit—operating as rhythmically and quietly as the day it was installed.

These far-sighted communities wanted the best, chose Shone Ejectors for recent installations:

Daytona Beach, Fla. (6)
Los Angeles, Calif., Hyperion Treatment Plant (2)
Campus, University of Washington, Seattle (2)
Chicago, Ill., West Side Subway Extension (22)
Osceola, Iowa
Mt. Clemens, Mich.
Freeport, L. I., New York (6)
Port Washington, L. I., New York (2)
Moorehead, Minn., Treatment Plant (6)
Anacostia Treatment Plant, Washington, D. C.

A few of hundreds of older Shones operating as efficiently and dependably as ever:

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and they throw in the shovel!

MINING coal near surface level is big business with the Badgett Stripping Corporation of Madisonville, Kentucky. And when it comes to shunting about their giant equipment, or transporting an output of 5,000 tons a day—they turn to GMC Diesel power *to save time and money.*

First the coal is stripped by large shovels or draglines which load it into bottom dump-haulers of 20-ton capacity. Then a shuttle of 14 dumpers, powered by GM 6-71 Diesels, maintains a constant flow of coal between shovel and washer—which is often miles away.

From time to time the giant shovels must be moved to new locations. That's where Badgett calls on GMC Model HDCWX 988, shown above giving a lift to a shovel with a mammoth appetite—*one that can scoop up five tons of coal at a single bite.*

Little wonder the Badgett people agree with Scotty McGaw, GMC dealer in Madisonville who sold them the equipment: *"These Diesels can haul bigger loads, haul them faster, and save you 56% on fuel costs alone—enough to pay for the new equipment in the first 300,000 miles!"*

Better check with your GMC dealer. Get the facts on these new 2-cycle Diesels—the modern power plants that give you *twice as many power strokes* per revolution as conventional 4-cycle types. You can't beat 'em for performance!

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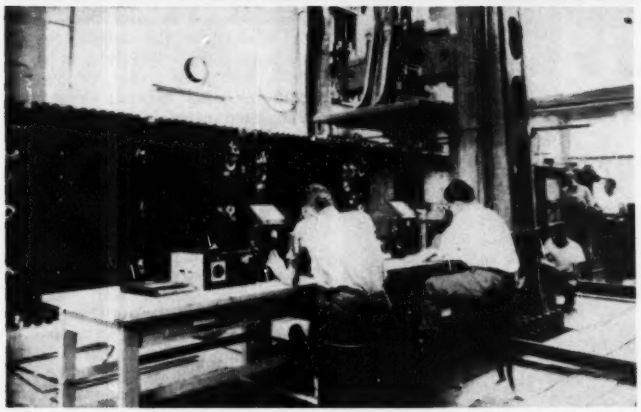

STRAIN GAGE DATA—Engineers record strain gage data as concentrated vertical load is applied to center of 38-ft plate girder specimen in Lehigh University study of the torsion of built-up structural members. The test, conducted on a 600,000-lb Baldwin hydraulic testing machine, is sponsored by the Pennsylvania State Department of Highways and the Bureau of Public Roads. This extension of the Lehigh University project is being conducted at Swarthmore College. Planned at Lehigh, the tests are being made by Prof. Gerald Kubo, of the New York University faculty, as a part of his Ph.D. dissertation at Lehigh under the general supervision of Prof. Sam Carpenter, of Swarthmore; Bruce G. Johnston, former Lehigh staff member now on the University of Michigan faculty; and William J. Eney, professor and head of the department of civil engineering and mechanics at Lehigh.

"Old Masters" program helps students

Bridging the gap of understanding between young engineers and experienced oldsters is the purpose of an "Old Masters" program that is being tried on an annual basis at Purdue University, Lafayette, Ind.

According to E. W. Wallace, Cincinnati management counselor, who developed the program idea, other colleges are considering inaugurating similar programs.

Here is how the program works:

"Old Masters"—outstanding men who are at or near the end of their active careers—agree to spend a few days on the campus, for the purpose of meeting with student groups.

A student governing body assigns meeting times and places for student groups wishing to meet with their choice of "Old Masters".

In a meeting students do not listen to a set speech. Rather, they sit down with the honored guest and ask him a wide variety of questions about professional, cultural and personal development. The procedure is strictly informal.

Behind the program is the fact that, on one hand, there are elderly people—the "Old Masters"—who "constitute a reservoir of excellent judgment, poise, culture and leadership," Wallace says, on the other hand, there are large numbers of young people "who badly need . . . the counseling and the scope of experience such "Old Masters" are prepared to give.

The "Old Masters" Program is a way of utilizing the experience of age in the service of youth, to the end that the post-college transition to the problems of independent life may be more understandingly made.

The first "Old Masters program" took place recently at Purdue with eight men and two women participating as the masters. Students, and faculty were uniformly enthusiastic and plans are now being made for a second session.

Undisturbed soil density found with radioisotopes

Densities of undisturbed soils are being determined by means of radioactive isotypes at Rutgers University. (ENR Jan. 4, p. 21).

In a research project sponsored jointly by the university's college of engineering, New Jersey's State Highway Department and the Bureau of Public Roads, a radiation source and

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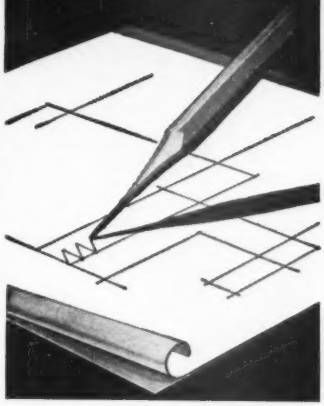

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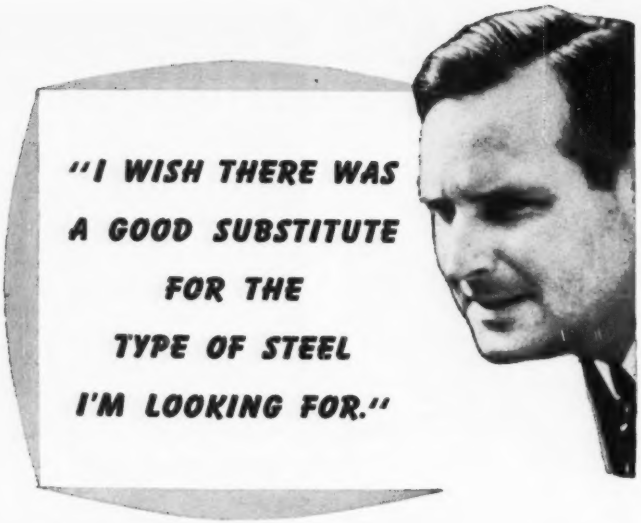

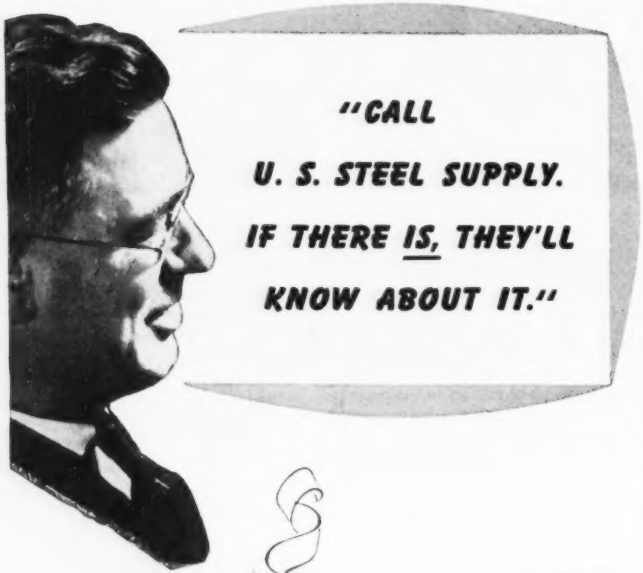

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USS

UNITED STATES STEEL

a radiation meter are being used to measure densities—as variations in gamma-ray transmission—through soil samples from 6 to 50 in. thick.

Cobalt-60 is the radioactive element used—18.5 millicuries of it. A 50% change in transmissibility has been recorded between loose and compacted materials, regardless of soil sample thickness.

Rutgers researchers plan to continue their studies, drilling vertical holes for insertion of radiation source and meter, to gain experience. They feel reading of the radiation counter should make it possible to determine whether or not the soil on a given construction project site could be compacted. Soil density changes due to temporary loads, frost action or temperature changes should be measurable, it is felt. The effect of successive passes of rollers—particularly referring to depth of compaction—will be sought.

Simplicity of the method is stressed: ease of drilling holes to any depth, inexpensive and portable instrumentation, and instantaneous indication of results. Its effectiveness on undisturbed samples is the method's chief asset.

Experiments have been made in ray-proof laboratories by professors J. J. Slade and R. K. Bernhard, in cooperation with the Agricultural Experiment Station of the university.

Faculty notes

J. E. Goldberg has been named an associate professor in structural engineering at Purdue University.

Hans H. Bleich has been appointed associate professor of civil engineering at Columbia University. Dr. Bleich is engaged in the completion of a research project known as "The Buckling Strength of Metal Structures", which is sponsored by the U. S. Navy and the Column Research Council.

Prof. Joseph C. Elgin has been appointed associate dean of the school of engineering at Princeton University. He is also consultant for the Atomic Energy Commission and a trustee of Associated Universities, Inc., which operates the Brookhaven National Laboratory at Upton, N. Y.

Wilbur M. Wilson, emeritus research professor of structural engineering, University of Illinois, has been honored by having dedicated to him a 250-page book on "Welded Deck Highway Bridges," edited by James G. Clark, professor of civil engineering at Illinois. The dedication was written by Prof. Whitney C. Huntington.

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There's no need for match-marking with Chapman standardized Sluice Gates — stem and couplings are completely interchangeable. All repairs and replacement parts can be easily installed in the field *without alterations.*

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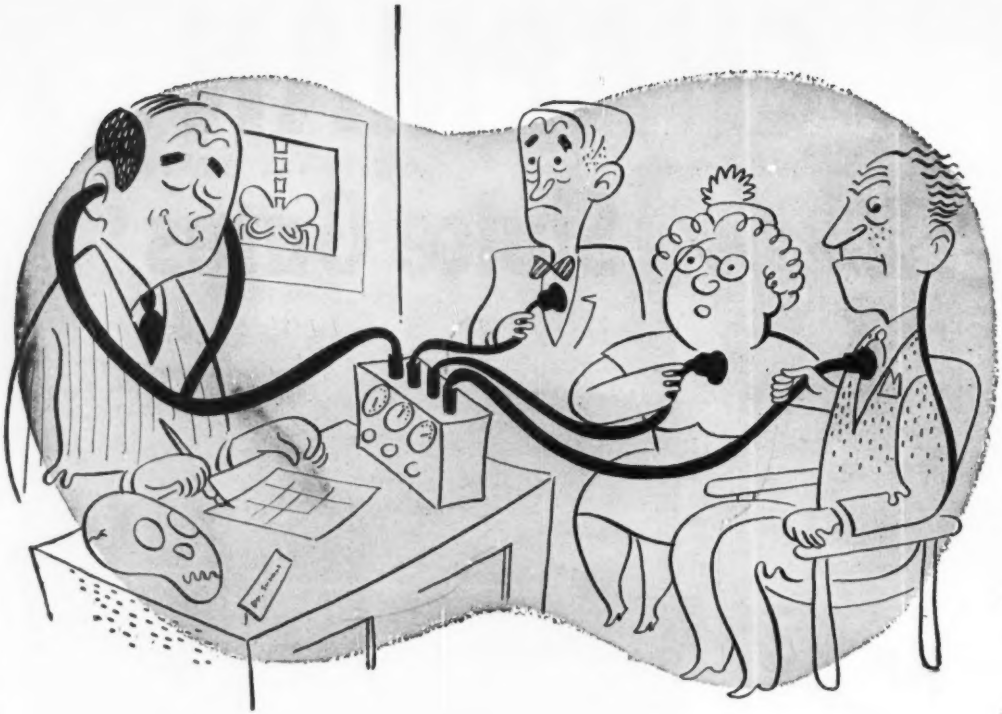

Reduced Treatment Costs

Less load at the disposal plant—and, therefore, a reduction in sewage treatment costs—is one of the practical advantages that often result from the use of Transite* Sewer Pipe.

There are two good reasons for this:

(1) Transite's special sleeve-type joints that cut sewer line infiltration to a minimum.

(2) Transite's long 13-foot lengths that reduce the number of joints in the line—an additional safeguard against infiltration.

Besides the immediate saving in treatment costs, this reduction in load also enables plant capacity to be conserved for future needs. And, where new treatment facilities are planned, it permits consideration of a smaller plant . . . with possible important economies in disposal equipment.

Other Transite Economies . . . Transite has an exceptionally smooth interior that reduces resistance to flow. This, combined with its long lengths that help maintain uniform grades, plus fewer joints that reduce turbulence, often permits designing the system with flatter grades and shallower trenches. Or, as an alternate economy, pipe of smaller diameter may be specified.

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MEETINGS

Mayor Gordon T. Butler of Fernandina has been elected secretary-treasurer of the Florida League of Municipalities, succeeding E. Leslie Cole. During three and a half years as secretary-treasurer, Cole helped the league increase its membership from 64 cities and towns to 188. The league played a large role in getting the 1949 legislature to give $12,000,000 of cigarette tax money to the cities.

R. P. Farrell of Nashville, director of the sanitation division of the State Department of Health, is president of the Tennessee Society of Professional Engineers. He succeeds J. E. McDonald of Knoxville. K. B. Stallings, planning engineer in the Nashville Department of Public Works, was elected secretary-treasurer, and Warren A. Coolidge, Nashville Director of Public Works was a director. Other officers are Lorin B. Allen of Memphis and Albert W. Stone of Chattanooga, vice-presidents. Dean N. W. Dougherty of the University of Tennessee at Knoxville, was elected Tennessee director of the National Society of Professional Engineers, with R. A. Merrill of Chattanooga as alternate.

Oklahoma Society of Professional Engineers has installed Fred G. Fellows as president; R. F. Danner, first vice-president; G. W. McCullough, second vice-president; Cy. Perkins, secretary-treasurer. Charles W. Worley, Oklahoma City, was elected national director and Allan Craig, Tulsa, retiring president, was chosen alternate. Stoner K. McLelland, F. W. Denner, F. W. Robson, Francis J. Wilson, and Harvey G. Freehauf were chosen directors.

H. L. Brantly is the new president of the Springfield chapter of the Illinois Association of Highway Engineers; O. W. Terry, vice-president; J. L. Park, recording secretary; A. F. Campbell, financial secretary, and W. M. Marshall, treasurer.

Hocking Valley chapter of the Ohio Society of Professional Engineers has elected Glenn A. Allen president; H. J. Ong, vice-president; John H. Shover, secretary-treasurer; John C. Owens, trustee; and George W. Clark alternate trustee.

F. L. Page, Port Clinton, has been elected president of the Lake Erie chapter of the Ohio Society of Professional Engineers, with Carl S. Schepflin, Fremont, vice-president; Charles A. Stevenson, Port Clinton, secretary-treasurer; Harold E. Childers, Fremont, trustee; and F. J. Rectenwald, Fremont, alternate trustee.

A. W. Dickson has been elected president of the Akron, Ohio, Builders Exchange. Other new officers are: C. A. Clemmer, first vice-president; Walter A. Jesse, second vice-president; and Claude Horning, treasurer. Carl Burger and Carl Messerly were elected directors-at-large. Wayne L. Myers was renamed executive secretary.

Chester H. Weatherell, Jr., has been elected president of the Chautauqua-Cattaraugus Chapter, New York State Society of Professional Engineers, Inc. Other new officers: Linsly G. Brown, vice-president; Lawrence A. Fletcher, secretary-treasurer; Murray N. Shelton, and W. Stewart Love, directors for two years.

CALENDAR

Association of State Planning and Development Agencies, Sherry-Frontenac Hotel, Miami Beach, Fla., April 15-19.

Concrete Reinforcing Steel Institute, annual meeting, The Homestead, Hot Springs, Va., April 16-21.

Illinois Structural Engineering Conference, University of Illinois, Urbana, Ill., April 17-18.

N. C. ASCE, Charlotte City Club, Charlotte, N. C., April 20-21.

California Sewage Works Assn., Hotel California, Fresno, Calif., April 25-28.

Pacific N. W. Conference, ASCE, Multnomah Hotel, Portland, Ore., April 27-28.

American Society of Civil Engineers, Pacific Northwest Conference, Multnomah Hotel, Portland, Ore., April 27-28.

American Water Works Association, annual conference, Miami, Fla., April 29-May 4.

Materials Handling Exposition and Conference, International Amphitheater, Chicago, Ill., April 30-May 4.

California Sections American Society of Civil Engineers, The Ahwahee, Yosemite National Park, Calif., May 3-5.

N. Y. State Society of Professional Engineers, Silver Anniversary, Hotel Statler, N. Y. City, May 10-12.

Building Officials Conference of America, King Edward Hotel, Toronto, Ont., May 14-17.

Society for Experimental Stress Analysis, spring meeting, Wardman Park Hotel, Washington, D. C., May 16-18.

Pacific Northwest Sewage Works Assn., Hotel Vancouver, Vancouver, B. C., May 17-19.

Pacific Northwest Section, AWWA, Hotel Vancouver, Vancouver, B. C., May 17-19.

Pennsylvania Society of Professional Engineers, Americus Hotel, Allentown, Pa., May 18-19.

Canadian Section, AWWA, Royal Alexandra Hotel, Winnipeg, Man., May 21-23.

New England and New York Sewage Works Associations, spring meeting, Hotel Kimball, Springfield, Mass., June 7-8.

President's Highway Safety Conference, Washington, D. C., week of June 10.

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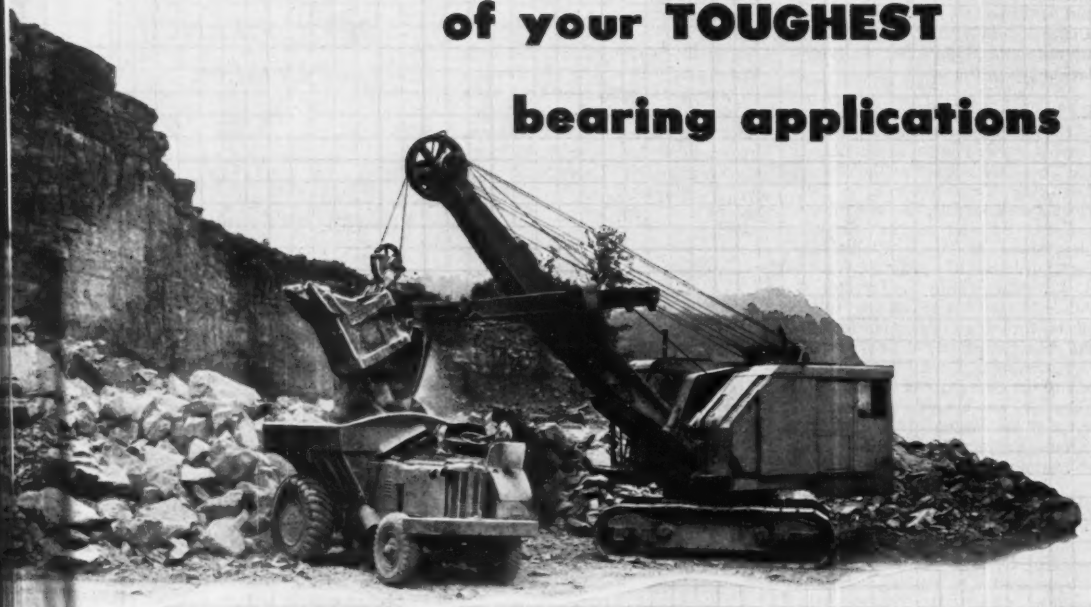

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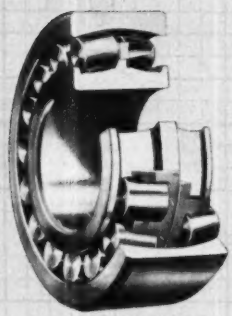

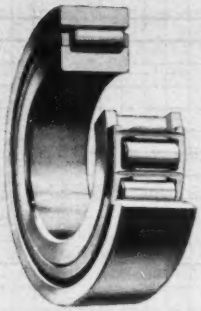

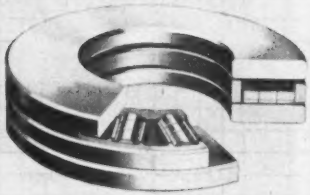

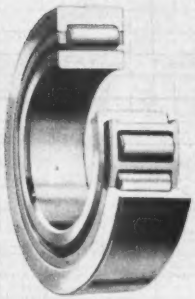

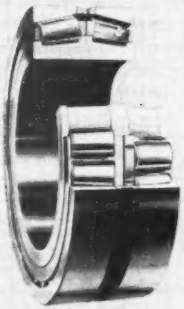

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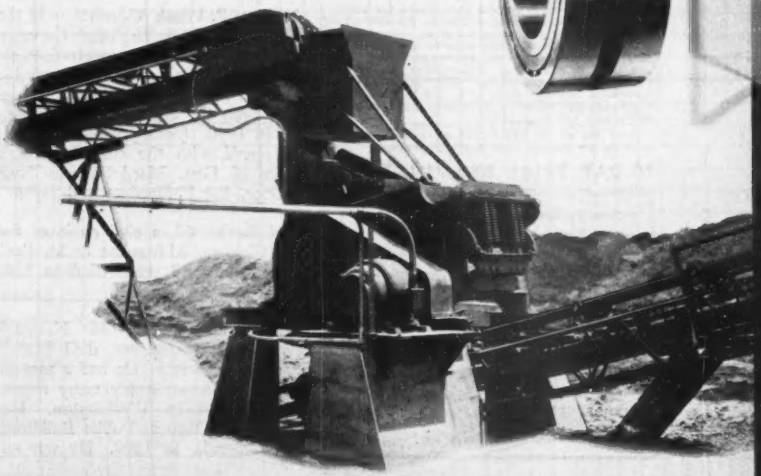

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OBITUARY

John P. Mellody, 84 retired chief engineer of the Rochester, N. Y., water works, died March 8.

Paul McLoud, a consulting engineer widely known in the Syracuse-Auburn, N. Y., area, died March 9 in Colorado. He won both the British Military Cross and the American Distinguished Service Cross during World War I.

Prof. Earl F. Watts, 53, of Scituate, Mass., chairman of the graphic department of the Massachusetts Institute of Technology and a member of the faculty 26 years, died in Quincy, March 11. He was a graduate of M. I. T. and was formerly a member of the faculty at the University of Missouri.

Horace S. Miller, 64, a retired civil engineer of Harrisburg, Pa., died there March 7. He was a graduate of Ohio State University.

Oliver S. Warden, 85, a key figure in the development of the West by reclamation, died March 12 at Great Falls, Mont. He was graduated from Dartmouth College in 1889 and went to Montana and was active in the upbuilding of Montana public improvements and resources for 60 years.

John A. O'Donnell, 66, retired senior civil engineer in the N. Y. State Department of Public Works, died March 11 in Albany. He had been in the state service for 45 years before his retirement last December. He was a graduate of Union College.

William P. Ward, 37, secretary of the Wisconsin State Highway Commission, was killed in an automobile accident near Elgin, Ill., on March 10. He received his civil engineering degree from the University of Wisconsin in 1940. During World War II, he served with the chief engineer's office of Gen. MacArthur in New Guinea, the Philippines and Japan.

Carl Swane, 60, a civil engineer for the Chicago, Milwaukee & St. Paul Railroad for 40 years, died in Milwaukee, Wis., March 9.

Francis Fair Gillen, 76, National Capital parks engineer, died March 17 in Washington. He had a part in the execution of nearly every recent park project in Washington. He joined the Office of Public Buildings and Grounds, in 1899. He was an 1898 graduate of the University of Michigan. One of his first major jobs was to supervise construction of the Lincoln Memorial. He had charge of the maintenance and restoration of the White House under five presidents. He also supervised construction of the Georgetown University Science Laboratory, the restoration of Mount Vernon and 300 PWA projects, in addition to the planning and development of areas along the East and West Potomac River.

John Howard Courtney, 55, Washington representative of the American Standards Association, and a leading authority on building code and construction standardization, died in New Orleans, La., March 8. He was secretary of the Joint Committee on Unification of Building Codes. He was a C. E. graduate of Cornell, 1917, and formerly was on the staff of the National Bureau of Standards, and for six years he had been superintendent of building construction for the George A. Fuller Co.

G. Raymond Abney, 63, Austin, Tex., engineer of the Texas State Highway Department, was killed in an automobile accident near Hico, Tex. Mar. 10. He was home on a visit from Ecuador where he had served as adviser to the government on its roads.

Henry Crandell, 57, city streets and sewers commissioner of Kansas City, Mo., died March 16. In the last war he was a major in the Corps of Engineers, specializing in airfield maintenance.

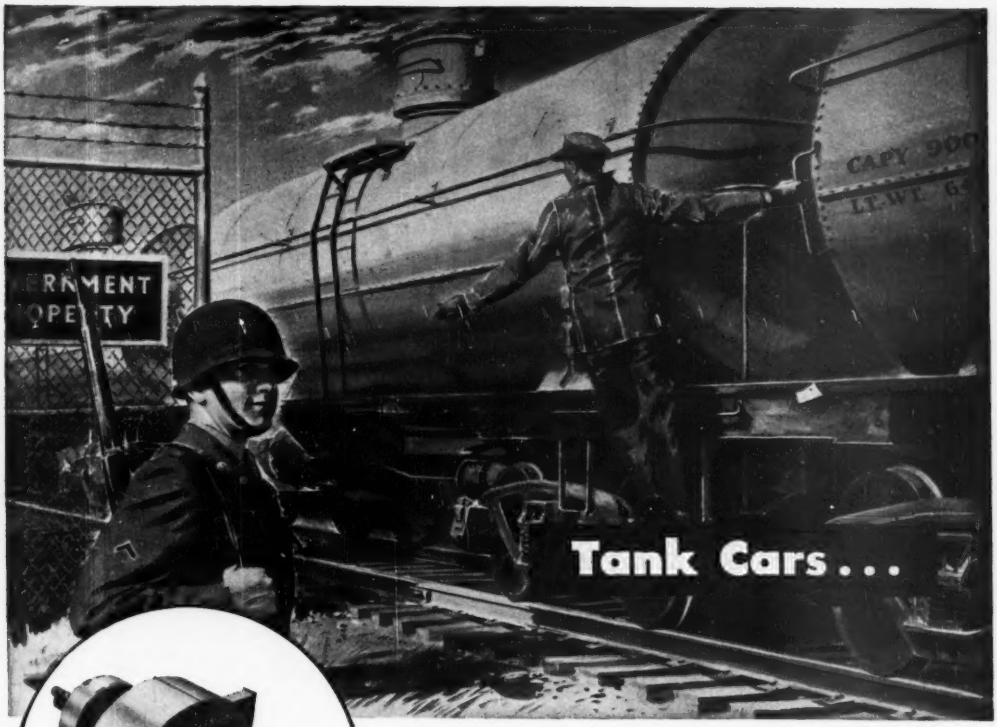
Charles S. Bennett, 59, assistant engineer of the Miami Conservancy District for 25 years, died March 11 at Dayton, Ohio.

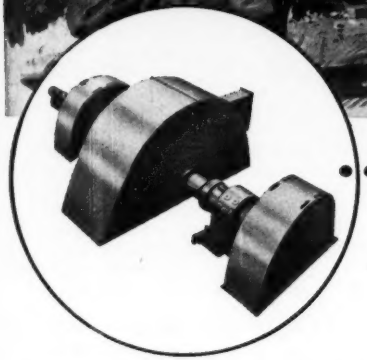
Col. Harry A. Montgomery, 53, vice-president and chief engineer for Material Service Corp., distributor of construction materials, died March 22 in Chicago. He was a graduate of West Point and served in both World Wars. In the latest he served as a division engineer in the Midwest area.

Clifford T. Rhodes, 50, founder of the Clifford T. Rhodes Engineering Co. of Boston, died March 24 in Needham, Mass. He was a graduate of Northeastern University.

Frank A. Chambers, 66, head of Chicago's department of smoke inspection and abatement, died March 21. He pioneered in modern methods of combatting smoke and lectured throughout the country on the subject. He joined the city's smoke department

(*Continued on page 76*)





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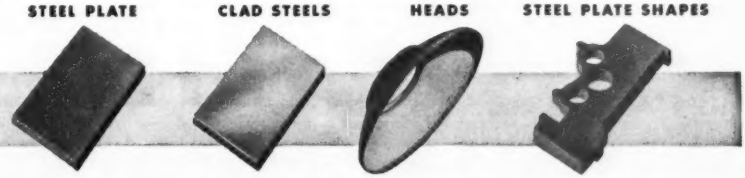

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in 1908 and became its head four years later. He was a founder of the Smoke Prevention Association of America. He was graduated from the old Armour Institute of Technology.

William G. Wood, 75, former superintendent of the Melrose, Mass., Public Works Department, died at Harpswell, Me., on March 25.

C. P. Hunter, 64, Texas State Highway Department resident engineer at San Augustine for the last six years, died in Shreveport, La., March 17. He had previously been Texas State Highway Department resident engineer at Beaumont for several years and at Jasper for eighteen years.

A. A. Miller, 71, former chief engineer maintenance of way, Missouri Pacific Lines, who retired in 1949, died March 25 in Oklahoma City, Okla. He was a former president of the American Railway Engineering Association. He was a C.E. graduate of Ohio State University, 1902, and had been with the Missouri Pacific for 40 years.

Charles R. Moore, 69, a professor of engineering at the University of Illinois for three years and an associate professor at the Newark, N. J., College of Engineering, died March 17 in Washington, D. C.

John T. Smoody, 58, died recently in Oakland, Calif. He served with the Corps of Engineers in World War II as constructing quartermaster for Camp Roberts, Calif., and for installations at the Oakland Port of Embarkation. He had also spent two years in India on the construction of airports.

Walter Irving Nevius, 60, government and private engineer, died March 25 in Frederick, Md. He had served as an engineer in the U. S. Army and also helped in germ warfare research at Camp Detrick, Md., from 1943 to 1945.

Arthur B. Weaver, 69, park engineer for Erie County, N. Y., for more than 25 years, died March 24. He received his degree in civil engineering from New York University. Formerly he did survey work for a coal mining company in Pennsylvania, the Union Pacific Railroad in Colorado, and the Colorado Fuel & Iron Co. in Denver. Later he was employed by the Spaulding Fibre Co., Inc., the New York Central Railroad, the Bethlehem Steel Co., and John W. Darling & Co., an engineering firm. He was one of the engineers who planned and erected the Pan American Exposition in Buffalo in 1901.

1 TOURNADOZER replaces 2 crawlers

Shuttles between two jobs...12 miles apart

William J. Muehlenbeck Excavating Co. of Saginaw, Michigan, landed an airport drainage contract at Pontiac at the same time as they started widening and re-grading U. S. 24 north of Detroit. Although the two jobs were 12 miles apart, contractor's rubber-tired C Tournadozer handled the dozer work at both spots... replacing one crawler-type rig on the 75,000-yd. highway, and eliminating one crawler at the airport.

12 pay yards in ½ minute

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When accumulated backfilling called for dozing at the airport, scrapers worked their long-haul dirt with a crawler-pusher... while Tournadozer highballed over main highways to Pontiac, where it backfilled around 18" and 24" drainage tiles. As soon as this task was done, the 19 m.p.h. "C" returned to Rt. 24 to take up the push-loading assignment again.

96% efficient on all work

Whenever necessary, Tournadozer also cleared brush, removed stumps, and prepared entrance roads. On all work, over the course of both jobs, Owner Muehlenbeck reports that his "C" operated at 96% efficiency.

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. . . load his truck and move on or keep a whole fleet of trucks on the move . . .
. . . unload hopper cars direct . . .
. . . or, for higher capacity, place the hopper and in a shallow track pit . . .
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. . . or unload dry batches for delivery into ready-mix trucks . . .

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ALL MATERIAL CAR UNLOADER

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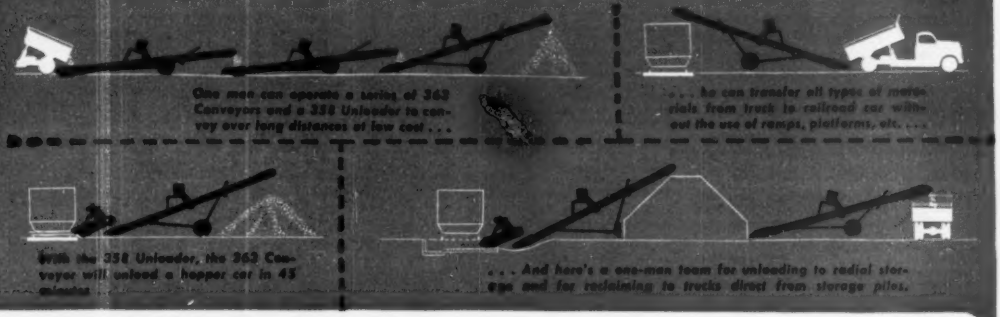
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Hungry Horse Dam and Power Plant in Montana

The $1,541,912.09 low bid for completion of Hungry Horse Dam and Power Plant, part of the Hungry Horse Project in Montana, was awarded the contract even though it was 38% above the engineer's estimated $952,294.45. The four bids submitted to the Bureau of Reclamation on Mar. 1, 1951, were priced 9% apart, with the low bid only .7% below the next highest.

The work is located on the South Fork of the Flathead River, approximately 9 miles southeast of Columbia Falls, Montana. It includes the installation of floor finishes, miscellaneous structural steel and metalwork, all plumbing fixtures and heating and ventilating system in the power plant and in the elevator towers of the dam. Also the installing of accessory hydraulic and mechanical equipment in the plant, and the installation of turbines, governors, piping and electrical material.

The material will be furnished by the government except in those instances, noted in the unit price schedule, where the contractor will furnish supplies. Contractor must transport government furnished material. The following government equipment will be available for use by the contractor without charge after installation: two 290 ton traveling cranes and lifting beam, one 25 ton machine shop crane and one 6 ton draft-tube gantry crane.

Minimum wage scale is: unskilled labor, $1.50; cement finishers, $2.10; electricians, $2.35; ironworkers, $2.13-$2.28; power equipment operators, $1.675-$2.275; and truck drivers, $1.50-$1.90.

The work must be completed in accordance with the following time schedule:

	Unit No. 1	Unit No. 2	Unit No. 3	Unit No. 4
	calendar days			
(a) Installation of turbine parts to be embedded in second stage concrete	65	175	135	220
(b) Installation of non-embturbine parts, including main bearing, to permit instal of generator lower bearing bracket by others	280	370	555	645
(c) Install & operation of the unit, including instal of all lighting in the operating areas	445	540	690	780
(d) Painting of outlet pipes and bellmouth castings	200 days			
(e) Installation of struct-steel take-off structures	280 days			
(f) Installation of cable trays to permit installation of cables from switchyard to to cable spreading room	325 days			
(g) Installation of fire protection system, service & water system, service & air system	415 days			
(h) Installation and connection of transformer bank K1A and transformers K2A, K3A, and K3C; instal, & conn & testing of all circuit breakers, buses and accessories to permit delivery of power from generator G1 to the above transformers; instal, conn & test of 15,000 volt power cables from generator bus to transformer KSA	445 days			
(i) Ins & conn of transformer bank K4A; inst, conn & test of all circ breakers, buses, and accessories to permit delivery of power from generator G3 to transf bank K4A, to transf K3A; ins, conn & test of 15,000 volt power cable from genert bus to transf K8B; instal, in place only of circuit breaker J4A and its attached potential transf, including connections from the power transformer side of the breaker to the outdoor bus structure & all connections to the potential transformer	690 days			
(j) Remainder of work	1,100 days			

Penalty for each day's delay will be as follows: (a) $150, unit 1; $100 each, units 2, 3 & 4. (b) $350, unit 1; $200, units 2, 3 & 4. (c) $350, unit 1, $100, units 2, 3 & 4. (d) $50. (e through h) $350. (i & j) $100. In the event the contractor is required to pay a penalty, the combined damages for the various parts will not exceed $300 per day; damages for unit 2 of a, b & c will not exceed $200 per day; for unit 3 of a, b & c, $200; and for unit 4 of a, b & c, $200.

Due to the size of this unit price schedule, it will be published in two sections, with part two to follow in the April 19 issue.

Bidders included:

1 Donovan, James, Wismer, & Becker Constr. Co., Seattle, Wash. (Contract)	$1,541,912.09
2 Grafe-Shirley-Lane Co., Los Angles, Cal	1,552,521.85
4 Guy F. Atkinson Co., Seattle	1,683,816.80
Engineer's estimate	952,294.45

Items	Quantity	Unit prices 1 C	2
Transport mat'l, T	3,000	$13.10	$10.50
Excav for duct line, cy	340	12.40	12.90
Backfill, cy	270	3.30	2.80
Reinf bar, ¼ round or less, furnish & p, lb	2,600	0.25	0.17
Conc in duct line, cy	70	54.50	60.00
Preformed bit-fiber joint mat'l, f & p, sf	30	1.50	1.00
Colored bonded conc finish, floor, stair land, hatch cover, 1½"-2", sy	4,000	6.60	6.40
On floor, hatch cov, 2½"-3", sy	380	6.55	8.90
On stairs, sy	150	7.25	12.00
Col bond conc curb caps, lf	390	1.35	1.50
Wall base, lf	5,100	0.88	2.00
Asph tile, f & i, sf	1,340	0.50	0.34
Asph cove base, f & i, lf	345	0.50	0.25
Rubber tile, f & i, sf	2,210	1.21	0.80
Rub cove base, f & i, lf	110	0.50	0.34
Fixed glass, metal glass set in metal lath, plaster partition, conc wall, sf	330	4.60	6.00
Misc metal work for power pl, elev tower of dam, i, lb	9,000	0.27	0.30
Metal stair tread, nosing, i, lf	950	1.00	2.00
Metalwk for cabletray in pp, i, lb	28,000	0.27	0.175
Asbest cem sheet for cab tray, i, lf	2,750	0.77	0.68
Handrail, st, i, lb	11,000	0.45	0.87
St grat, cover pl, floor pl, hatch cov, bend angles, bulkhead, rotor erection pl in pp in dam, i, lb	87,000	0.26	0.18
Metal platfm for elect equip, i, lb	150,000	0.184	0.12
Glaz metal part, f & i, sf	290	3.83	6.00
Metal partition for toilet-stal, lf	185	11.30	21.00
St swing door, i, sf	3,600	3.03	2.40
Met fire door, i, sf	93	4.50	2.40
Take-of struct, erect, lb	210,000	0.147	0.12
Hydraulic turb, 4-105,000 hp, test & i, ls		313,377	654,000
Bulkhd, sprng seal ring, on 2-hyd turb, i & remov, lb	115,000	0.048	0.065
Governor, 4-200,000 ft lb, test & i, ls		29,832	8,160
Jet pump, i, lb	9,000	0.60	0.20
Flanged strainer, i, lb	23,700	0.392	0.32
Oil pump unit, motor-dr gear-type, i, lb	1,000	1.50	0.50
Water pump unit, mot-dr centrifug-typ, i, lb	9,400	0.37	0.10
Chlorinat equip, i, lb	2,000	0.775	0.35
Sewage disp unit, duplex-typ, i, lb	4,200	0.54	0.50
Air compra, mot-dr 100 psi, i, lb	24,000	0.20	0.11
350 psi, i, lb	1,500	0.455	0.60
After-cooler, moist separator, i, lb	1,550	0.62	0.50
Air receiver, i, lb	14,800	0.186	0.21
Instrument, indicat & record i, ls	.....	3,400	11,985
Fire-ext system, carb-dioxide, i, for generator, ls	.....	4,043	1,012
For oil purifier & oil storage room, i, ls	.....	3,038	506.00
Spare cyl bank, carb-diox, i, ls	.....	836.00	506.00
Fire-ext, portable, hose reel & cart, i, ls	.....	1,200	1,615
Equip in fire hose cabinet, i, ea	18	59.50	10.00
St workbench, f & i, ls	.....	300.00	237.00
Oil purif, portble, filter-paper dry oven, 1 ea, i, ls	.....	966.00	440.00
Name plate, i, ea	100	12.65	2.00
Sump pump, control & piping, i, lb	7,000	0.51	0.30
Make-up piece, i, lb	92,000	0.384	0.30
Machine tool, i, ls	.....	13,206	8,070
Piping system, f & i, Class A, 2" less, lb	9,000	2.30	0.75
2½" +, lb	96,000	1.17	0.80
Cl B, 2" less, lb	2,000	3.90	1.00
2½" +, lb	5,600	3.04	0.80
Cl D, lb	50	30.00	1.20
Cl E, lb	200	5.70	1.20
Cl F, 2½" +, lb	43,000	1.30	0.80
Cl L, 2" less, lb	4,000	2.03	1.40
2½" +, lb	26,000	1.76	1.00
Cl N, 2" less, lb	4,000	3.72	0.85
2½" +, lb	10,500	1.18	0.63
Cl P, lb	600	4.00	0.85
Cl Q, steel, 2" less, lb	500	4.30	1.20
2" +, lb	2,900	1.45	1.00
Cl Q, brass, lb	50	14.00	2.00
Valve, fitting-special, i, lb	16,000	0.33	0.70
Flex hose connect, f & i, lb	500	18.20	6.00
Pipe hanger, support, f&i, lb	18,000	4.17	1.20
Heat, ventilate system, f & i, in power pl, ls	.....	109,300	46,000
Elev tower, ls	.....	6,035	43,700
Heat, vent system in dam, i, lb	5,100	1.02	0.70
Furnish & install, Lavatories, ea	22	200.00	60.00
Water closet, ea	20	180.00	83.00
Urinal, ea	8	244.00	102.00
Service sink, ea	5	321.00	84.00
Kitchen sink, ea	1	561.00	82.00
Elect storage water heater, 60 gal cap, ea	1	598.00	150.00
40 gal cap, ea	1	538.00	120.00
20 gal cap, ea	3	293.00	100.00
10 gal cap, ea	3	230.00	100.00
Elec drink water cooler, i, ea	8	100.00	20.00
Holder, tl paper, f & i, ea	20	34.00	5.00
Cabinet, f & i, ea	14	43.00	10.00
Chrom-pl pipe, accessorie, i, lb	500	4.00	2.00
Exposed elect metal cond in pow pl, dam, appurt work, 1¼" less, lf	15,900	1.27	1.00
1¼" +, to 2½", lf	8,900	1.97	2.00
2½" +, lf	1,050	4.28	3.00
Exposed grnd conductor in dam, ap work, i & connct, lb	2,000	1.84	1.30
Exposed elect non-met cond in pow pl, i, lf	1,700	2.20	1.50
Embed non-met cond betwn manholes, 2", lf	6,200	0.51	1.00
4", lf	660	0.78	1.40
Remove temp bypass enclosure from temp bypass cable route betw mnh, lf	135	1.16	1.00
Install:			
Insul elect conductor in pp, dam, ap work, 600 volt, No 12 AWG, lf	59,200	0.07	0.06
No. 10, lf	89,700	0.082	0.07
No. 8, lf	29,200	0.095	0.09
No. 6, lf	1,400	0.11	0.11
No. 4, lf	8,700	0.15	0.13
No. 2, lf	14,000	0.11	0.15
No. 1, lf	5,800	0.21	0.17
No. 1/0, lf	1,600	0.24	0.20
Insul elect conduct in pp, 600 volt, 400,000 circular mil, lf	2,400	0.45	0.35
600,000 cm, lf	900	0.59	0.40
5,000 volt, 500,000 cm, lf	500	2.04	0.50
Insul elect cond in pp, 5000 volt, No. 4/0 AWG, lf	500	1.80	0.45
No. 2/0, lf	400	1.65	0.40
No. 1/0 in pp, dam, ap work, lf	2,600	1.35	0.35
No. 8, lf	550	0.63	0.20
600 volt, No. 2/0, lf	1,000	0.25	0.20
600 volt, in pp, dam, ap work No. 3/0, lf	1,800	0.28	0.21
No. 4/0, lf	1,700	0.33	0.24
600 volt, 250,000 cm, lf	1,200	0.35	0.25
300,000 cm, lf	900	0.39	0.30
500,000 cm, lf	350	0.51	0.40
750,000 cm in dam, ap work, lf	400	0.70	0.50

(Part II will be published next week)

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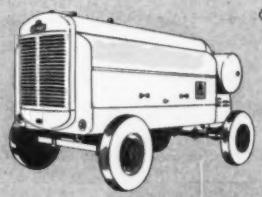

Why LeRoi-CLEVELAND Wagon Drills cut deep-hole costs: — 4-inch bore, powerful force of blow, strong rotation, and thorough hole-cleaning action. Higher drilling speed with big bits. You can drill at any angle — put your holes where you want them for better breakage, lower costs. For shallow holes the new lightweight DR34 unit is your best bet.

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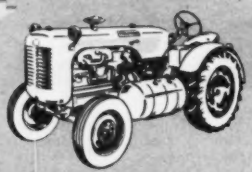

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CONSTRUCTION REPORTS

Bids Asked—Low Bidders—Contracts Awarded

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

ELSIE EAVES, Manager *J. A. MAHONEY, Reports* *M. R. ROESSLER, Statistics*

NEW ENGLAND

BIDS ASKED—HEAVY CONSTRUCTION

† **R. I., Frenchtown**—RANGE REPAIRS, etc.—B.A. 4/17—U.S. Property & Disbursing Officer, 51 Stenton Ave., Providence, alterations, repairs at Sun Valley Range, Serial No. NG-37-019-51-8.

BIDS ASKED—BUILDINGS

▲ **Mass., Springfield**—HOSPITAL—B.A. 5/24—City, Pub. Welfare Dpt., municipal hospital, Iona and State Sts. $10,000,000. CD 11/20.

LOW BIDDERS—BUILDINGS

Beacon Constr. Co., 102 Hano St., Allston, Mass. Low Bidder. $997,425. 100 HOUSING units, Spring Court, Proj. PHA 19-1, WOBURN, MASS. City of Woburn Housing Auth., 11 Winn St., Woburn, Mass. Bids Mar. 21. CD 3/20.

CONTRACTS—BUILDINGS

▲ † **Robert A. Verrier Constr. Co.**, 65 Commercial St., Portland, Me. Contract Awarded. $2,000,000. PETROLEUM FACILITIES, SEARSPORT, ME. Dpt. Army, N.E. Div. Army Base, 666 Summer St., Boston, Mass.

A. E. Stephens, 1200 Main St., Springfield, Mass. Contract Awarded. $877,259, SCHOOL, Broad St., Middle Turnpike, MANCHESTER, CONN. Town, Town Hall, Manchester, Conn. Bids Feb. 27, awarded Mar. 20. CD 3/12, under LB.

Rolling Parks Estates, 40 Hawthorne St. Owner Builds. $500,000. 9 connecting 2 story, brick, garden type APARTMENTS, MANCHESTER, CONN.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION

N. Y., Middletown—B. A. 4/23—Board Estimate & Apportionment. G. W. Chumard, comr. P. Wks., City Hall, secondary sewage treatment works at the present municipal sewage disposal plant, incl. two 105 ft. dia. stone filters; two 105 ft. dia. clarifiers, one new digester, two enclosed sludge drying beds and pumping stations, incl. piping, fittings, concrete structures. Plans deposit $25; adv. ENR 4/12. CD 10/12/44.

BIDS ASKED—BUILDINGS

N. Y., New York—NURSES SCHOOL, etc.—B. A. 4/18—Dpt. Pub. Wks., Municipal Bldg., Zone 7, Contr. 1, demolition, general constr. work; elevators and dumbwaiters, metal equip. top soiling and planting; Contr. 2, plumbing and kitchen equip.; Contr. 3, heating, ventilating, air-conditioning, refrigerator work; Contr. 4, electrical and lighting fixtures for the Nurses' School and Residence, at Bellevue Hospital. Plans deposit $50 Contr. 1, $25 each Contrs. 2, 3, and 4. Extended date. CD 3/26.

† **N. J., Asbury Park**—POST OFFICE REPAIRS—B. A. 4/18—Pub. Bldgs. Service, 250 Hudson St., New York, 13, N. Y., misc. repairs to U. S. Post Office.

N. Y., New York—SCHOOL—B. A. 4/24—Supt School Bldgs, Design & Construction, 49 Flatbush Ave. exten., Brooklyn 1, N. Y., general constr.; plumbing and drainage, heating and ventilating, electrical and lighting fixtures for new P.S. 109, Popham Ave. and Palisade Pl. (Spec. Nos. 10, 11, 12 and 13 of 1951 and Amendment No. 1). Plans deposit $16 general contr. $7, plumbing and drainage, $8, heating and ventilating, $8, electrical and lighting fixtures.

N. J., Maple Shade—PLANT—Bids Asked—K.S.M. Products, Inc., 6512 Park Ave., Pennsauken, N. J. mfg. plant. Approx. $100,000. Frank W. Hall, 503 4 Ave., Haddon Heights, archt.

LOW BIDDERS—HEAVY CONSTRUCTION

Penaco Electric Corp., Cantiague Rd., Hicksville, N. Y. Low Bidder, $39,275, Contr. 426, furnishing, installing, testing electrical equip. and conductors and for installing and testing sub-station equip. furnished by the city and for testing electrical equip. installed under previous contracts for sewage treatment plant and for North St. and Neversink pumping stations (being built under Contr. 381) in Port Jervis, NEW YORK, N. Y. Bd. Water Supply, 120 Wall St., New York, N. Y. Bids Mar. 27. CD 3/1.

George A. Slade, Dutch Neck Rd., Bridgeton, N. J. Low Bidder, $94,727, road surf. various locations, CUMBERLAND, N. J. Cumberland Co. Bd. Freeholders, Bridgeton, N. J. Edward H. Maier, co. engr.

CONTRACTS—HEAVY CONSTRUCTION

A.B.C. Excavating Co., 834 N. 34 St., Camden, N. J. Contract Awarded. $60,000, sanitary sewer and manholes, RIVERSIDE, N. J. Boro, Riverside, N. J. Bids Feb. 26.

CONTRACTS—BUILDINGS

Louis Feldsher & Son, 2534 W. Thomson St., Phila., Pa. Separate Contracts. $570,000 RESIDENTIAL DEVEOPMENT, Cedar Ave., PITMAN, N. J. Dante D. D'Anastasio, 1815 Federal St., Camden, N. J., archts.

Frank Ramondo, 2619 Chestnut St., Phila., Pa. Separate Contracts. Approx. $300,000. RESIDENTIAL DEVELOPMENT, Coopertown and Springfield Rds., BROOMALL, PA.

Boileau Bros., 113 N. Main St., North Wales, Pa. Contract Awarded. $82,000. oxygen PLANT addn., CONSHOHOCKEN, PA. National Cylinder Gas Co., 840 N. Michigan Ave., Chicago, Ill. Louis Zengeler, c/o owner, general supt.

Gowen Williams Corp., 8501 Williams St., Phila., Pa. Separate Contracts. Approx. $600,000. RESIDENTIAL DEVELOPMENT, Fayette St., PHILA., PA.

Leon Street Homes, Inc., Finance Bldg., Phila., Pa. Separate Contracts. Approx. $500,000. RESIDENTIAL DEVELOPMENT, Terry St., PHILA., PA. James G. Durham, 34 S. 17 St., Phila., Pa., archt.

Bannett, Inc., 924 N. 46 St., Phila., Pa. Contract Awarded. $89,000. 2 car WASH BLDGS., PHILA., PA. Phila. Minit-Man Corp., 4131 Chestnut St., Phila., Pa. Clifford E. Garner, 10 S. 18 St., Phila., Pa., archt.

F. B. Davis & Sons, 240 N. 16 St., Phila., Pa. Contract Awarded. $250,000. MANUFACTURING BLDG. repairs, PHILA., PA. Strick Co., Whitaker and Godfrey Sts., Phila., Pa.

SOUTH

LOW BIDDERS—HEAVY CONSTRUCTION

Cleary Bros. Constr. Co., West Palm Beach, Fla., Low Bidder. $686,536, constr. one 180-foot concrete slab bridge on concrete pile bent one 60 ft. concrete slab bridge on concrete pile bents; 1209 ft. bridge consisting 29 thirty-six ft. concrete deck girder spans on conc. pile bents an electrically operated double leaf bascule, Road 40 over Hilsborough River (Intracoastal Waterway) at New Smyrna Beach, S. P. 7917-101 Volusa Co. FLORIDA. State Rd. Dpt., Jacksonville Fla. Bids Mar. 21. CD 3/20

State Hy. Comm., Jackson, Miss. rejected bids Mar. 27, base preparation, double bit. surf. tr. 5.322 mi. Miss. Hy. 2 between Kossuth and U. S. Hy. 72, F. A. Secondary Proj. S. 304 (2), Alcorn Co., $135,000. double bit. surf. tr. 5.037 mi. Miss. Hy. 27 between Crystal Springs and Hopewell, F. A. Secondary Proj. S 116 (3), Copiah Co., est. $92,000. grading, drainage, culverts 10.988 mi. U. S. Hy. 90 between Pascagoula and Mississippi-Alabama Line, F. A. Proj. FI 003-1 (5), Jackson Co. $545,000; base and double bit. surf. tr. 4.672 mi. Miss. Hy. 13 between Morton and Forkville; F. A. Secondary Proj. S 246 (3), Scott Co., $90,000; grading, bridge, grav. surf. 3.239 mi. Miss. Hy. 13 between Morton and Forkville, F. A. Secondary Proj. S 246 (4), Scott Co., $85,000, MISSISSIPPI, CD 3/19.

Gordon Walker, Box 287, Baton Rouge, La. Low Bidder. $848,832. thirty-three 40 ft. I beam spans, one 75 ft. I beam span, one 240 ft. swing span, one 80 ft. I beam span and one 20 ft. I beam span, c. conc. approach 0.334 mi. Pearl River Bridge on Bogalusa-Poplarville Hy., State Rte. 26, S. P. 47-05-03, F. A. Proj. F 413 (1), Washington Parish, La., Pearl River Co., Miss., LOUISIANA and MISSISSIPPI. State Hy. Dpt., Baton Rouge, La. CD 2/15, under Louisiana.

LOW BIDDERS—BUILDINGS

R. P. Farnsworth & Co., Inc., 1515 S. Salcedo St., New Orleans, La. Low Bidder. $587,820. DORMITORY addn., NEW ORLEANS, LA. Newcomb College, 1229 Broadway, New Orleans, La. Bids Mar 26. CD 3/23.

CONTRACTS—HEAVY CONSTRUCTION

Aaron J. Conner, R. F. D. 2, Roanoke, Va. Contract Awarded, $203,247, sewage treatment plant; $48,111, interceptor lines, Vinton, Va. City, Vinton, Va. Bids Mar 7. CD 2/16.

† **Arundel Corp.**, Pier 2, Pratt St., Baltimore, Md. Contract Awarded, $585,000, dredging at submarine base, KEY WEST, FLA. Dpt. Navy, U. S. Naval Base, Charleston, S. C. Bids Jan 23 CD 1/30, under LB.

▲ **Alvie Goolsby**, Ripley, Miss. Contract Awarded. $121,731 est. $128,000, grading, drainage, culverts 5.927 mi. Miss. Hy. 25 between Belmont and Fairview, F. A. Proj. F040-2 (2), Tishomingo and Itawamba Counties ***Keaton Constr. Co., 1409 Battery St., Little Rock, Ark. $215,483, est. $200,000. grading, drainage, culverts, bridge, box bridge 5.396 mi. Miss. Hy. 14 between Louisville and Kosciusko, F. A. Secondary Proj. S 138 (3), Winston Co.***Burdine Constr. Co., Greenville, Miss., $444,343, est. $375,000. grading, bridge, grav. base bridge, grav. double bit. surf. tr., 8 in. uniform c. conc. 8.033 mi. U. S. Hy. 61 between Elizabeth and Bolivar Co. Line, F. A. Proj. F 166 (4), Washington Co.*** **Edward E. Morgan Co., Inc. and Jones & Gillis, Inc.**, 2951 Canton Ave., Jackson, Miss. $561,468, est. $620,000 grading, drainage, culverts, box bridge, bridge 16.104 mi. Hy. 8 between Grenada and Calhoun City, S. P. 8-1524 (3), Grenada and Calhoun Counties; $361,549, est. $390,000, grading, drainage, culverts, bridges 5.459 mi. Miss Hy. 8 between Grenada and Calhoun City in Calhoun Co., S. P. 8-1524 (2), Contr. II, Calhoun Co., MISSISSIPPI. State Hy. Comm., Jackson, Miss. Grand Total $1,704,575. Bids Mar. 27, awarded Mar. 28. CD 3/19.

CONTRACTS—BUILDINGS

George W. Reagan Co. Inc., 510 Grainger Ave., Knoxville, Tenn. Contract Awarded. Approx. $82,000. WAREHOUSE and OFFICE, KNOXVILLE, TENN., Burkart-Schier Chemical Co., 500 McGhee St., Knoxville, Tenn. CD 1/18.

W. F. Holt & Sons, 1531 Demonbreun St., Nashville, Tenn. Contract Awarded, $663,140, general constr. 292 men students, double DORMITORY, West End Ave., NASHVILLE, TENN. Vanderbilt University, Nashville, Tenn. CD 2/20/50.

MIDDLE WEST

BIDS ASKED—HEAVY CONSTRUCTION

† **Continental Constructors, Inc.**, 3227 North Broadway, St. Louis, 7, Mo. Low Bidder. $143,569, est. $149,076. Flood wall and closure structure, East Side Levee and Sanitary Dist., Proj. Item I-J, CIVENG No. 23-065-51-53, St. Clair Co., ILLINOIS. U. S. Eng., 834 U. S. Court House & Custom House, 1134 Market St., St. Louis, L, Mo. Bids Mar. 37. CD 3/15.

L. G. Arnold, Inc., Eau Claire, Wis. Low Bidder. $97,932. Contr. 1, structure and approaches 0.18 mi. The Berlin- S. T. H. 21 (Spoor Bridge and Approaches) C. T. Hy. "XX" Proj. S 0596 (3), Waushara Co., WISCONSIN. State Hy. Comn., Madison, Wis. Bids Mar. 27. CD 3/7.

▲ **Harry & Jos. Doulanger**, Casco, Wis. Low Bidder. $278,995. Contr. 1, grading, draining Old U. S. H. 41-North County Line (S. T. H. 23-North County Line Sect.) Road U. S. 41, Proj. F 03-1 (2), Fond du Lac Co.***N. M. Isabella, Inc., 714 Market Pl., Madison, Wis., $490,693, Contr. 1, c. conc. 7.586 mi. The Rockmunt-Superior Road, Y. S. Hy. 2 and 53, Proj. F 08-5 (42), Douglas Co.***P. W. Ryan Sons, Jamesville, Wis., $74,295, Contr. 1, c. conc. 0.699 mi. The Bridgeport-Prairie du Chien Rd., U. S. Hy. 18, Proj. F 017-1 (26), Crawford Co.,***Rock Road Constr. Co., Madison, Wis. $281,301, Contr. 1, bit. 10.574 mi. The S. T. H. 11-East County Line and West County Line-S. T. H. 89 Roads, U. S. Hy. 14, Proj. T 0-4-2 (8) and T 014-3 (15), Rock and Walworth Counties*** **J. P. Humphries, Inc.**, 1226 W. Wisconsin St., Milwaukee, Wis., $61,885, Contr. 1, bit. 0.973 mi. South Thirteenth Street (West Layton Ave.-City of Milwaukee Section) C. T. Hy. "W" Proj. S 0833 (1), Milwaukee Co.***Otto Wiesner, Inc. & Otto Wiesner, Superior, Wis., $121,824, Contrs. 1 and 2, bit., plant mix single aggregate type, 9.477 mi. The West County Line-Arkdale-S. T. H. 13 and Necedah Bridge and approaches Road, S. T. Hy. 21, Projs. S 0500 (13) and T 0500 (6), Adams and Juneau Counties***Payne & Dolan of Wisconsin, Inc., 735 N. Water St., Milwaukee, Wis., $131,884, Contr. 1, bit., plant single aggregate type, 11.337 mi. The Stratford-Mosinee Rd., S. T. Hy. 153, Proj. S 011 (3), Marathon Co.***Koepke Sand & Gravel Co., Appleton, Wis., $154,075, Contr. 1, bal-

PROJECTS COVERED

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $34,000; other public works $60,000; industrial buildings $82,000; other buildings $300,000.

Classes of Construction

(Name in order of Listing)

Water Supply	Latin America
Sewers, Waste Disposal	Public Buildings
Bridges	Commercial Buildings
Streets & Roads	Industrial Buildings
Earthwork, Waterways	Unclassified

Stages Reported

PROPOSED WORK: Including appointment of engineers or architects.

BIDS ASKED (new announcements only). For full calendar, see also preceding issues of ENR.

LOW BIDDERS: On jobs below $500,000 value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: Except awards to low bidders previously reported in low bidder stage.

Dates shown are of issue in which last previous report was published.

Symbols and Abbreviations Include:

†	Federal Government
▲	Project of $1,000,000 or over.
B.A.	Bids Asked
ENR	Engineering News-Record
CD	Engineering News-Record Construction Daily

last and grav. or crushed stone surf. 11.384 mi. The Rhinelander-Laona (Crandon-Laona) Rd., Proj. F 921-3 (15), Forest Co., WISCONSIN. State Hy. Comm., Madison, Wis. Bids Mar. 27. CD 3/7.

LOW BIDDERS—BUILDINGS

Bd. Educ., Fayette, O., rejected bids Jan. 12, 2 story SCHOOL, FAYETTE, O. Will re-advertise. CD 1/4.

CONTRACTS—HEAVY CONSTRUCTION

L. Walker Fauber Co., 319 Claremont Ave., Ashland, O. Contract Awarded. $213,420. Water main expansion; **Chicago Bridge & Iron Co.,** Guildhall Bldg., Cleveland, O. $219,640, 500,000 gal. storage tank, FREMONT, O. City, City Hall, Fremont, O. Conner Townsend & Assoc., 351 E. Ohio St., Chicago, Ill., engrs. Bids Mar. 8. CD 2/14.

Mosser Constr., Inc., Fremont, O. Contract Awarded. $74,000. WW, erect 2 concrete reservoirs and alter filter bldg., WOODVILLE, O. City, Woodville, O. Bids Jan. 24. CD 1/5.

CONTRACTS—BUILDINGS

Long Island Constr. Co., c/o Russell Ede, Rush St., Bellefontaine, O. Owner Builds, 50 medium-priced HOMES, Lake Ave., on 40 acre tract, 50-ft. wide streets, BELLEFONTAINE, O.

▲ Sollitt Constr. Co., 301 S. Columbia St., South Bend, Ind. Contract Awarded. $1,250,000. CHURCH, SOUTH BEND, IND. First Presbyterian Church of South, 301 W. Washington St., South Bend, Ind. Thomas & Wagoner, 117 S. 17 St., Phila., Pa., archts. CD 8/9/46.

Tonyan Constr. Co., 100 Borden St., McHenry, Ill. Contract Awarded. $100,000. FACTORY, MC HENRY, ILL. Riverside Mfg. Co., Riverside Dr., McHenry, Ill. Awarded Mar. 22.

Blackhawk Constr. Co., Hampton, Ill. Contract Awarded. $350,000. FACTORY, ROCK FALLS, ILL. International Harvester Co., 180 N. Michigan St., Chicago, Zone 1, Ill. Awarded Mar. 20.

W. H. & Nelson Cunliff Co., 3320 Lindell Blvd., St. Louis, 3, Mo. Contract Awarded. General constr. 2 story, 80x263 ft., brick masonry steel glass block, cut stone Central HIGH SCHOOL with 1 story, 60x143 ft. wing, 201x247 ft., auditorium-gymnasium overall and 2 story, 36x43 ft. brothers residence, St. Clair and Kings Highway, EAST ST. LOUIS, ILL. Catholic Diocese of Belleville, Most Rev. Albert R. Zuoweste, Bishop, 222 S. 3 St., Belleville, Ill. Bids Mar. 7. CD 2/27.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION

▲† Texas—B.A. 4/24—U. S. Eng., 606 Santa Fe Bldg., Galveston, converting locks, Colorado River Flood Gates, Colorado River, Matagorda, Matagorda Co., Inv. No. CIVENG 41-243-51-82. $1,250,000. Bid date changed. CD 3/22.

LOW BIDDERS—HEAVY CONSTRUCTION

▲† Edward Peterson Co., 903 WOW Bldg., Omaha, Neb. **Foley Bros., Inc.,** 900 New York Bldg., St. Paul, Minn., and **The Tellepsen Constr. Co.,** Box 2536, Houston, Tex. Low Bidders, $5,576,725. spillway, outlet structures, dike and dam closure of Texarkana Dam, Serial No. CIVENG 16-047-51-45, TEXAS. U. S. Eng., foot of Prytania St., New Orleans, La. Bids Mar. 28. CD 3/21.

State Hy. Comm., Austin, Tex. cancelled bids to have been opened Apr. 18, flexible base, one course surf. tr. 8.236 mi. hy. U. S. 80 from 1 mi. west of east city limits of Longview to Hallsville, Control No. 96-6 and 7-8 and 8, FP No. F 21(3) and FI 142 (3), Gregg and Harrison Counties, TEXAS. CD 3/28.

† Stanley W. Newman Co., Box 1646, Mobile, Ala. Low Bidder, $132,548, photo reconnaissance and laboratory, Bergstrom Field Air Force Base, Inv. No. Eng 41-243-51-45, AUSTIN, TEX. U. S. Eng., 606 Santa Fe Bldg., Galveston, Tex. CD 3/20, under LB.

† John Broad Constr. Co. and **W. K. Jennings Electric Co.,** Box 494, Austin, Tex. Low Bidder, $201,782, est. $300,000, navigation aids, lighting sys.; **Stovall Constr. Co.,** 6541 Forest Park, Dallas, Tex., $70,970, high intensity airport lighting sys., at Bergstrom Field, Air Force Base, Inv. No. Eng. 41-243-51-55, AUSTIN, TEX. U. S. Eng., 606 Santa Fe Bldg., Galveston, Tex. Bids Mar. 23. CD 3/9.

† Stovall Constr. Co., 6541 Forest Park St., Dallas, Tex. Low Bidder, $147,615, runway extens., Bergstrom Field Air Force Base, Inv. No. Eng 41-243-51-42, AUSTIN, TEX. U. S. Eng., 606 Santa Fe Bldg., Galveston, Tex. Bids Mar. 23.

† W. D. Anderson Co., 3100 Beverly Rd., Austin, Tex. Low Bidder, Approx. $79,000, est. $125,000. erection, modification 2 portable steel hangars, Serial No. E-41-093-51-48, FORT HOOD, TEX. U. S. Govt., 4th Army Authorization, c/o Post Engineers, Fort Hood, Tex. Bids Mar. 23.

W. O. Pelphrey, Electric Bldg., Fort Worth, Tex. Low Bidder, $240,220, sewage treatment plant, GRAHAM, TEX. City, Graham, Tex. Bids March 21. CD 3/7.

Arroyo Colorado Navigation Dist., Box 708, Harlingen, Tex. cancelled bids to have been opened Mar. 21, bulkheads, HARLINGEN, TEX. Approx. $75,000. Will re-advertise. CD 3/5.

The Brown Co., Box 2426, Houston, Tex. Low Bidder, $180,000. storm sewers Lockwood area, HOUSTON, TEX. City, City Hall, 900 Brazos, St., Houston, Tex. R. W. Lee, Commerce Bldg., Houston, Tex., engr. Bids Mar. 28.

Walter A. Smith Co., 615 Velasco St., Houston, Tex. Low Bidder, $61,000, est. $65,000. double-course treatment on roads and streets in Precinct 3, HOUSTON, TEX. Harris Co., Court House, Houston, Tex. H. R. Jensen, Stewart Bldg., Houston, Tex. engr. Bids Mar. 23.

(Continued on page 88)

Heltzel BUILDS IT BETTER

HELTZEL

SUPERIOR *Batching Plants*

• More efficient batching plants will effect savings for you in operation and plant costs. Heltzel's specialized engineers work out your specific problems on both stationary and portable installations, ranging in capacities from 30 to 500 tons. Why not let a Heltzel representative explain exclusive features and Heltzel's better construction.

- CENTRAL MIX PLANTS
- TRANSIT MIX PLANTS
- BULK CEMENT PLANTS (Portable and Stationary)
- AGGREGATE BATCHING PLANTS (Portable and Stationary)
- CONCRETE BUCKETS

• Recirculating cement system — fills sealed cement compartment (right), and then automatically switches to loading of storage tank.
• Ohio Conveyor system — stock-piles aggregates and loads bin with one elevating conveyor and one tunnel conveyor. Diverters unload incline conveyors to stock piles at any specified points.
• 1000 bbls. capacity cement storage (others 600 to 2000 bbls. optional) assures continuous operation of plant
• Heltzel batchers, automatic or manually operated, are designed for speedy operation and uninterrupted service. Complete plants, including conveyor systems, are Heltzel designed and built for uniform quality.
• Trouble-free cement valves, exclusive with Heltzel, at all cement discharge points assure smooth flow through narrow passages.
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Heltzel BUILDS IT BETTER

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HELTZEL STEEL FORM & IRON COMPANY
WARREN, OHIO, U. S. A.
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Stationary Batching Plants ☐ Road and Airport Forms ☐
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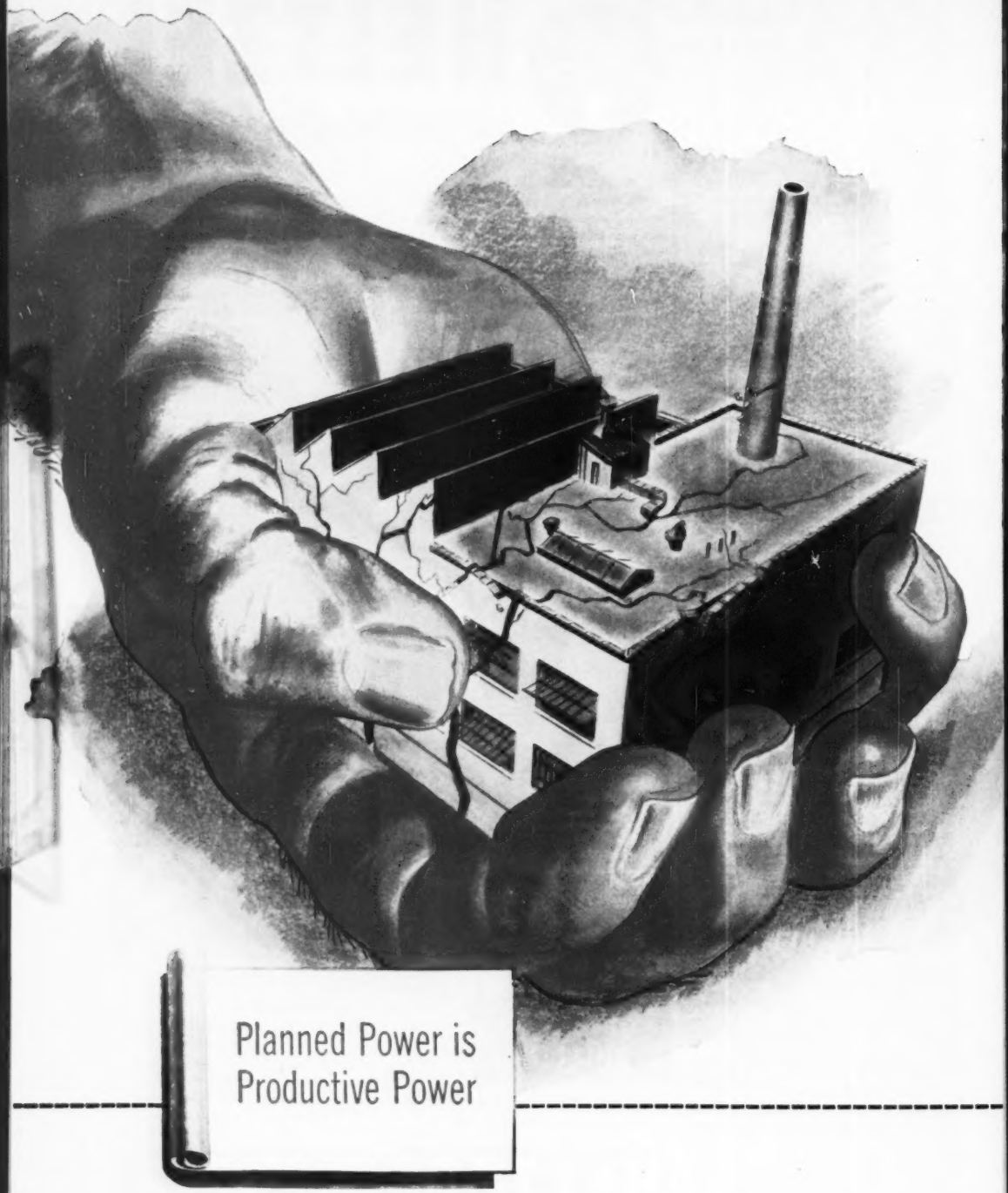
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can throttle production...

Plan power FIRST!

A properly planned distribution system maintains the right voltage to keep production at top level. The vital role of power in industrial plants makes it very important to select the proper system in the first stages of planning for new building or expansion. Adequate power is essential to the efficient operation of the finest engineered production line.

Planning for adequate plant power—present and future—must be a co-ordinated part of the whole planning job. Electrical distribution systems which are superimposed as an afterthought often are costly and inadequate.

Westinghouse engineers can assist you in the critical early stages of selecting an electrical distribution system for your plant. There is "one best" system for any given plant, and our engineers have the skill and experience to help you choose it. They can propose adequate, efficient electrical systems for present *and* future loads . . . at the lowest long-term cost to you.

Our engineers have worked for years to bring new economies and new efficiency to plant power distribution. Take advantage of their knowledge. Get the most out of your power *and* your plant. Call your nearest Westinghouse Office or write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania.

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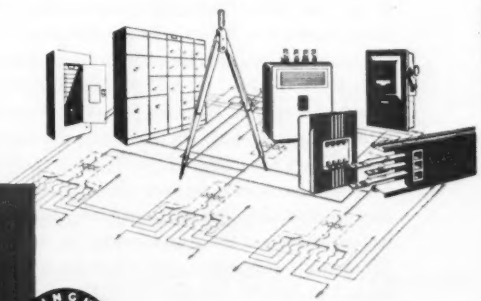
B-4045 contains fact-filled pages and color diagrams completely explaining the 11 basic systems used in industry today. This booklet will provide a specific answer to your power distribution problems.



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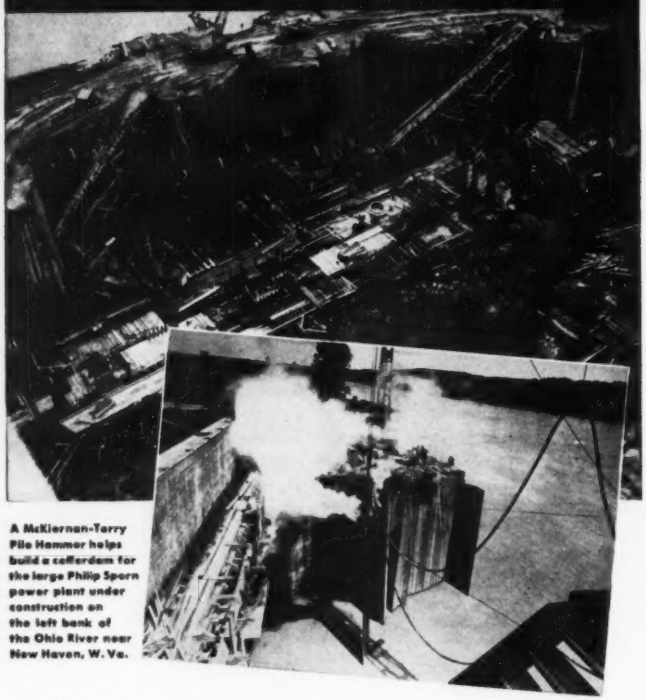
WESTINGHOUSE

SYSTEM PLANNING

Holding Back the Ohio

FOR A BIG EXCAVATION



A McKiernan-Terry Pile Hammer helps build a cofferdam for the large Philip Sporn power plant under construction on the left bank of the Ohio River near New Haven, W. Va.

A protecting earth dike could not stop the waters of the Ohio River from seeping into a huge 500,000 cu yd excavation. That's why the contractor, Sollitt Construction Company, Inc., built a water-tight cellular sheet pile cofferdam. • A McKiernan-Terry 9-B-3 Double-Acting Pile Hammer played an important role in this project. Quickly and efficiently, the pile hammer drove length after length of 63-ft steel piling down to rock . . . to form eight 54-ft diameter cells. The concrete foundation for the large power plant could then be poured without being menaced by the river. • Big job or small, contractors everywhere know they can count on powerful, fast-driving McKiernan-Terry equipment. Bulletin describes 15 sizes of pile hammers and 2 sizes of pile extractors. Write for your copy.

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COAL TOWERS

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MOHNING TO 42" I. D.

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13 PARK ROW, NEW YORK 38, N.Y.
Plants: Harrison, N. J. and Dover, N. J.

MKT-3576

(Continued from page 85)

† Layne-Texas Co. Ltd., 6419 Maple St., Dallas, Tex. Low Bidder. $38,523, est. $100,000. water supply well, lines, well house, pumping unit, etc. Inv. No. Eng 41-443-51-5.. LUBBOCK, TEX. U. S. Eng., 1127 Texas & Pacific Bldg., Fort Worth, Tex. Bids Mar. 20.

LOW BIDDERS—BUILDINGS

Francis Orshek Constr. Co., Fremont, Neb. Low Bidder, $447,230, general constr. FINE ARTS CENTER at Chadron Teachers College, CHADRON, NEB. State Normal Bd., Lincoln, Neb. Bids Mar. 24. CD 3/14.

Lippert Bros. Co., 2800 N. Santa Fe St., Oklahoma City 5, Okla. Low Bidder. $360,000, est. $300,000. grocery WAREHOUSE, N.E. 36 and Oklahoma Ave., OKLAHOMA CITY, OKLA. Safeway Stores Co., Tremont and Howard Sts., San Francisco, Calif., Bids Feb. 28. CD 2/27.

Cain & Cain, Majestic Bldg., Fort Worth, Tex. Low Bidder, $516,000, est. $500,000. general constr. Ridglea Junior HIGH SCHOOL, FORT WORTH, TEX. Fort Worth Public School, c/o Ed. P. Williams, bus. mgr., Fort Worth, Tex. Bids Mar. 27. CD 3/7.

CONTRACTS—HEAVY CONSTRUCTION

Kaw Paving Co., 1 and Topeka Sts., Topeka, Kan. Contract Awarded. $165,252. paving, EMPORIA, KAN. City, Emporia, Kan. CD 12/2/49.

▲ † Del E. Webb Constr. Co., S. 23 Ave., Phoenix, Ariz. Contract Awarded. $3,942,000. 119 barracks bldgs. at Amarillo Air Force Base, AMARILLO, TEX. U.S. Eng., 1127 Texas & Pacific Bldg., Fort Worth, Tex. Bids about Mar. 21, awarded Mar. 28. CD 1/26.

Stuckey Constr. Co., 1515 Kemp St., Wichita Falls, Tex. Contract Awarded. $241,065, paving various streets, WICHITA FALLS, TEX. City, Wichita Falls, Tex. F. M. Rugeley, city engr. CD 3/1, under LB.

CONTRACTS—BUILDINGS

▲ The Austin Co., 510 N. Dearborn St., Chicago, Ill. Contract Awarded. $2,500,000. diesel engine FACTORY addn., ST. LOUIS, MO. Busch-Sulzer Bros. Diesel Engine Co. Div. of Nordberg Mfg. Co., 3300 S 2 St., St. Louis, Mo. Awarded Mar. 15.

Jack Rich Constr. Co., West Memphis, Ark. Owner Builds. $500,000, 75 HOMES, WEST MEMPHIS, ARK.

Commonwealth Electric Co., 1901 Y St., Lincoln, Neb. Contract Awarded. $513,700. GENERATING PLANT, VOLTAIRE, N. D. Central Power Co-operative, Minot, N. D.

Fairbanks-Morse & Co., 902 Harney St., Omaha, Neb. Contract Awarded. $601,116. electric PLANT exten., equip., TRENTON, NEB. City, Trenton, Neb. Bids Mar. 20. CD 3/6.

Lloyd Lockett, Norman, Okla. Own forces. $700,000. 5 story 72-room HOTEL, NORMAN, OKLA. CD 10/25.

FAR WEST

BIDS ASKED—HEAVY CONSTRUCTION

▲ California — TRANSMISSION LINES — B.A. 4/24 — B.A. 4/24—Southern Counties & Southern California Gas Co., 810 S. Flower St., Los Angeles, (selected list bidders) natural gas transmission line, install only 23 mi. 30 in. and 21 mi. 22 in. steel lines, to serve Santa Monica, West Los Angeles, and San Fernando Valley. $2,365,000. CD 1/17/50.

Wash., Seattle—STRUCTURAL STEEL FRAMING—B.A. 4/24—City, County-City Bldg., Seattle, Zone 4, structural steel framing for Ross powerhouse. E. R. Hoffman, city light supt.

▲ Calif., Los Angeles—TRANSIT SHED.—B.A. 4/25—City Harbor Dpt., City Hall, steel, rein.-con. transit sheds $3,000,000. Plans deposit $25. E. C. Earl, engr. Bids Mar. 28, rejected. CD 3/6.

SOON LETS CONTRACT—HEAVY CONSTRUCTION

Calif., Hillsborough—Vista Properties, Inc., Hillsborough, soon lets contract installing water and sewerage systems, surface La Senda Rd. Lee E. Ham, 1126 Broadway, Burlingame, engr.

LOW BIDDERS—HEAVY CONSTRUCTION

▲ United Concrete Pipe Corp., Box 425, Baldwin Park, Calif. Low Bidder. $1,129,744. Furnishing, installing water mains, appurtenances in Oakland, L/S 536 Schedule C, rein.-con. pipe, OAKLAND, CALIF. East Bay Municipal Utility Dist., 512 16 St., Oakland Calif. Bids Mar. 23. CD 3/13.

CONTRACTS—HEAVY CONSTRUCTION

† F. V. Hampshire, P. O. Box 448, Salinas, Calif. Contract Awarded. $146,346. Football stadium FORT ORD, CALIF. Purch. & Contg. Office, Fort Ord, Calif. Bids Feb. 28, awarded Mar. 23. CD 12/12.

ALASKA

LOW BIDDERS—BUILDINGS

▲ † Haddock Engineers, Ltd., Insurance Bldg., Seattle 4, Wash. Low Bidder, $5,786,000. composite BACHELOR HOUSING, SERVICE and RECREATION CENTER, Inv. No. S95-507-51-18, WHITTIER, ALASKA. Bids Mar. 27. CD 2/21.

CANADA

SOON LETS CONTRACT—BUILDINGS

Que., Cap de la Madeleine—RETREAT HOUSE—J. L. Caron, archt., 302 Bonaventure St., Three Rivers, soon lets contract retreat house near Normal School, Passage St. for Rev. Frs. Oblats of Marie Immaculie, 1201 Visitation St., Montreal. Approx. $500,000. CD 3/15/46.

(Continued on page 93)

No matter how you say it

It Comes Out the Same

Last Year – This Year – Next Year

in 1940 we said

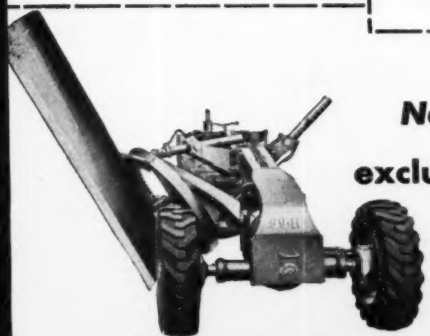
A motor grader without power on the front wheels is like a horse with roller skates on his front feet.

in 1945 we said

It's not in the cards for a grader with rear drive to equal the performance of one with All-Wheel Drive.

in 1950 we said

Don't handicap your horsepower! No grader with a dead front end can possibly deliver maximum power-at-the-blade.



No two ways about it! **Austin-Western's exclusive All-Wheel Drive goes more places . . . does more things . . . moves more material, farther and faster.**

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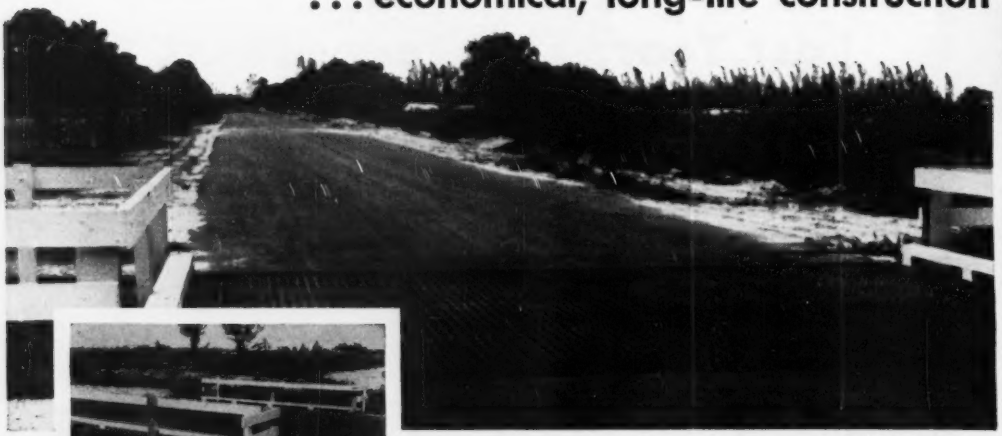
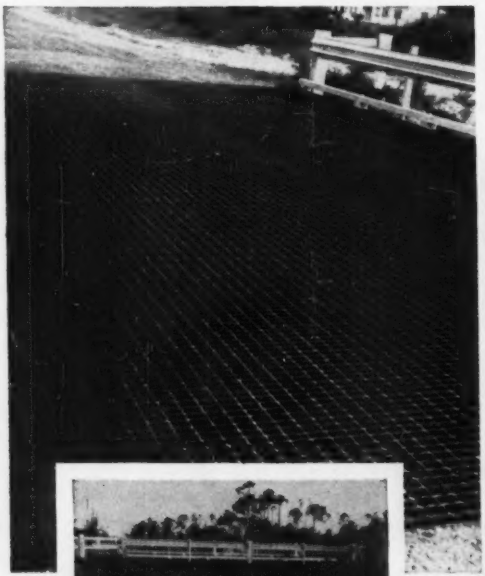
Austin Western

U·S·S I-BEAM-LOK Open Flooring and

. . . economical, long-life construction

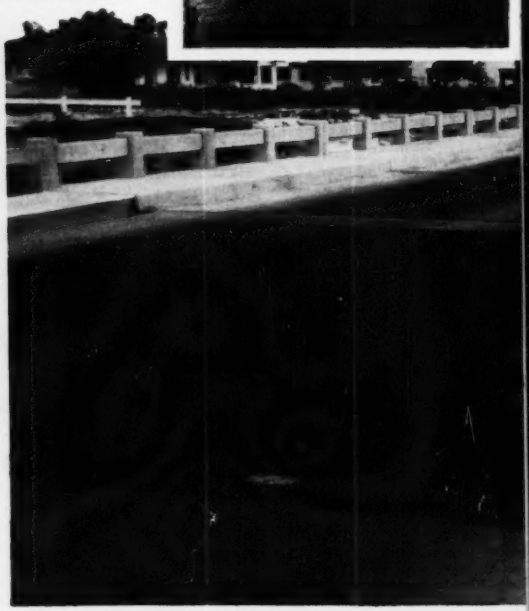


This trestle-type open floor bridge on Benoist Road is another example of I-Beam-Lok construction in Palm Beach County. It is 20' 8" long and carries a 22' roadway.



This bridge in Palm Beach County, Fla., (floored with I-Beam-Lok) is 41' 4" long and carries Belvedere Road across a canal.

Military Trail Bridge across the Palm Beach Canal shows how U·S·S I-Beam-Lok Open Flooring made a safe, sturdy bridge floor at low cost. Cleary Brothers Construction Company of West Palm Beach, Fla., was the contractor.



U·S·S STEEL H-BEAM Bearing Piles

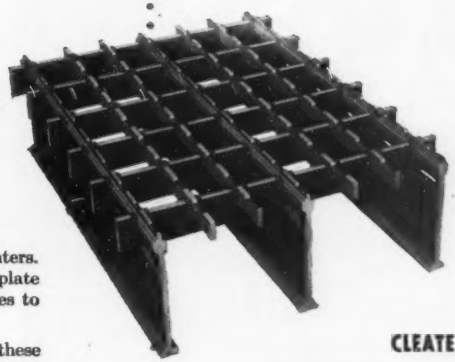
for trestle-type bridges

Strong, safe, low-cost bridges utilizing U·S·S I-Beam-Lok *Cleated-Tread* Open Flooring and Steel H-Beam Bearing Piles have proved highly satisfactory in Palm Beach County, Fla.

These all-steel bridges carry a 22′ roadway consisting of 5″ Open I-Beam-Lok. The deck is supported on rolled beam stringers, which rest, in turn, on standard H-Pile bents on 30′ centers. Abutments also consist of H-Pile bents with a 36″ plate welded across the abutment at the top of the piles to act as a retainer for the earth fill.

According to County Engineer J. M. Boyd, these structures have proved to be simple and economical to erect. The only equipment needed is a small crane for handling the pile and the I-Beam-Lok, a medium-sized pile driver and a small welding machine.

Best of all, the cost of such bridges is exceptionally low. Labor is minimized since a small amount of field welding is all that is necessary to install the steel supporting beams and I-Beam-Lok Flooring.



CLEATED-TREAD NON-DIRECTIONAL SURFACE MEANS SAFER, SURER TRACTION

U·S·S I-Beam-Lok Open Flooring gives you a uniform, firm-gripping, non-directional riding surface. The modified I-Beams have raised, narrowed ribs which are level with the tops of the supplementary bars. The bars and beams are both made with irregularly spaced notches about ⅛″ deep and ¾″ long.

This *Cleated-Tread* floor is made in two types—type PL in which the main carrying beams are placed parallel to traffic and type TR running transverse to traffic. They are essentially the same in depth, strength properties and size of openings. They differ only in the pattern of the riding surface and in weight—type TR weighing approximately 18.8 lbs./sq.ft. and type PL, approximately 19.1 lbs./sq. ft.

Available in units measuring 74″ in width and up to 49′ in length, this lightweight, all-steel open flooring can be applied directly to stringers on spans up to 4′ centers to permit H-20 leadings. It does not require secondary supports.

To find out more about U·S·S I-Beam-Lok Open Flooring with high traction Cleated-Tread Surface, contact the office nearest you. Our engineers will be glad to discuss its many advantages with you.

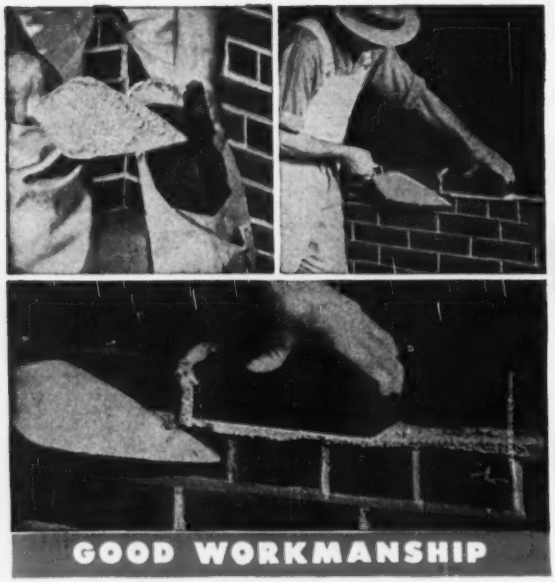
UNITED STATES STEEL COMPANY, PITTSBURGH
COLUMBIA STEEL COMPANY, SAN FRANCISCO
TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS **I-BEAM-LOK**

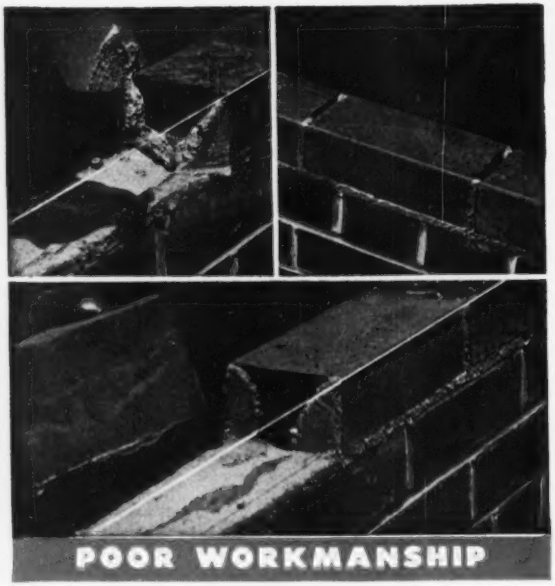
1-374

UNITED STATES STEEL

GOOD BRICKWORK = GOOD DESIGN + GOOD WORKMANSHIP + GOOD MATERIALS



Plenty of mortar should be thrown on the end of the brick to be placed. The brick should then be pushed into place, so that mortar oozes out of the head joint.



When dabs of mortar are spotted on the corners of the brick, the mortar does not completely fill the head joint, and voids are still left.

FULL HEAD JOINTS, WITH BRIXMENT, HELP PREVENT LEAKY WALLS

WE SUGGEST THAT—

All head joints in both face brick and back-up work should be completely filled with mortar. If head joints are not completely filled, water may penetrate to the inside of the wall through openings in the joints. *Dabs of mortar spotted on the corners of the brick are not nearly enough to fill the joints.*

Take a look at the two examples shown at the left, and you'll instantly see why full head joints are an essential part of *good workmanship* in bricklaying.

No mortar material alone, not even Brixment, can make watertight masonry walls, so long as open crevices and pockets are left in the mortar joints.

Brixment mortar makes it far easier for the bricklayer to do good work. It is smooth and plastic — so soft and workable that the bricklayer can use enough mortar to fill the joint, and still "place" the brick easily and accurately to the line.

Brixment mortar has greater plasticity, higher water-retaining capacity and bonding quality, greater resistance to freezing and thawing, and freedom from efflorescence. Because of this *combination* of advantages, Brixment is the leading masonry cement on the market.

LOUISVILLE CEMENT COMPANY, Incorporated, LOUISVILLE, KENTUCKY

(Continued from page 88)

CONTRACTS—HEAVY CONSTRUCTION

▲ **George Hardy Ltd.**, 163 Wicksteed Ave., Toronto, Ont. Contract Awarded. **$3,832,406,** est. $3,000,000, 1 story, 55x1400 ft., rein.-con. supply bldg. at Royal Canadian Air Force, TORONTO, ONT. Defence Contr. Ltd., 441 Queen's Quay, Toronto, Ont. Bids Mar. 2, awarded Mar. 27. CD 2/23, under Public Buildings.

CONTRACTS—BUILDINGS

▲ **Canadian Kellogg Co. Ltd.**, 194 Bloor St. W., Toronto, Ont. Contract Awarded. **$9,000,000,** DISTILLATION and CRACKING UNITS and RECOVERY PLANT, SARNIA, ONT. Imperial Oil Ltd., 56 Church St., Toronto, Ont. Bids Mar. 8, awarded Mar. 27. CD 1/12.

PROPOSED PROJECTS

WATER SUPPLY

Calif., Pomona—Pomona Valley Municipality Water Dist., c/o Chamber of Commerce, Pomona, 32,000 18- to 30-in. concrete steel cylinder pipe, irrigation feeder line, **$275,000.** Engineering Service Corp., 1127 W. Washington Blvd., Los Angeles, Calif., consult. engr. CD 1/8.

▲ **Colo., Pueblo and Leadville**—North Side Water System, Pueblo, Colo., expansion reservoir site and water facilities. **$1,500,000.**

Idaho, Lewiston—City, City Hall, expansion pumping plant to increase output from 6 to 11 m.g.d., $250,000; supply lines, etc., **$350,000.** John W. Cunningham & Assocs., Spalding Bldg., Portland, Ore., consult. engrs. CD 1/17.

La., Homer—City, voted bonds, water and light plant imprvs. $135,000. CD 3/6.

Tex., Sulphur Springs—City, voted bonds, earthen water storage lake $150,000; steel water elevated storage tank and tower, $70,000; WW sys. rehabilitation, $60,000. Wyatt C. Hedrick, 904 Fort Worth Ave., Dallas, consult. engr.

Tex., Winnsboro—City, voted bonds, Proj. 1, water supply well, $40,000; Proj. 3, WW sys. distr. extens., sys. rehabilitation; elevated tank and tower, $175,000. J. M. Lloyd, 1620 S. Sneed St., Tyler, consult. engr.

▲ **Ont., Toronto**—Scarborough Twp., 2001 Eglinton Ave. E., WW to provide 10 m.g. water daily incl. pump. station, elevated water tanks, mains, pumping station on 20 acre site on Keenedy Rd. **$3,000,000.**

SEWERS, WASTE DISPOSAL

Colo., Aurora—City, City Hall, sewage disposal plant. $400,000. Lou Osborne, Tipton & Assocs., Insurance Bldg., Denver, consult. engrs. and archts.

Mass., Dedham—Town Pub. Wks. Dpt., 381 Washington St., sewer exten. $150,000. E. Worthington, 26 Norfolk St., engr.

Mo., Fulton—City, sewage plant addn. $125,000, E. T. Archer & Co., Railway Exchange Bldg., Kansas City, Mo., consult. engrs. CD 8/21.

Mo., Kansas City—City Pub. Wks., City Hall, Zone 6, Gardner Ave. Sewer Proj. in Northeast Industrial Dist., $463,000. CD 11/10/47.

Mo., Trenton—City, sewage plant exten. $400,000. E. T. Archer & Co., Railway Exchange Bldg., Kansas City, Mo., consult. engrs.

N. Y., New Windsor—Town, sewerage sys., treatment plant. $230,000.

O., Columbus—Comrs. Franklin Co., Court House, sanitary sewer distr. sys. and disposal plant for Groveport and surrounding area. **$300,000.** Oesso T. Mitchell, co. sanitary engr. CD 11/19/45.

Pa., Newtown—Newtown Boro Sewage Planning Comn., Newtown, sewerage sys. Approx. $100,000.

Tenn., Springfield—City, sanitary sewer imprvs. Proj. 40-P-1021. **$465,000.** Howard K. Bell, 553 S. Lime St., Lexington, Ky., consult. engrs. CD 4/17.

Tex., Iraan—City, voted bonds Mar. 17, storm sewers, $60,000; sanitary sewers, $70,000. Alamo City Engineers, 3005 Transit Tower, San Antonio, consult. engrs.

Tex., Sulphur Springs—City, voted bonds sanitary sewer rehabilitation, $75,000; sewage disposal plant, $135,000; exten. sanitary sewer lines, $110,000. Wyatt C. Hedrick, 904 Fort Worth Ave., Dallas, consult. engr.

Wash., Granger—City, City Hall, treatment plant and sewer lines. $147,000.

STREETS AND ROADS

Tex., San Antonio—Bexar Co., Court House, extending Stephenson Rd. from W. Commerce St., north to Fredericksburg Rd. $100,000. L. White, c/o owner, engr.

Wash., Seattle—City, City-County Bldg., Seattle, Zone 4, c. conc. sidewalks on W. Kenyon and adjacent streets. $127,463. R. W. Finke, city engr.

EARTHWORK, WATERWAYS

▲† **Michigan**—U. S. Eng., 2015 Cadillac Tower, Detroit control proj., dikes, dredging rivers, wid'n.,

Bore Vertical & Horizontal Holes *FAST!*

Ka-Mo drills bore vertical holes for Piling, for Concrete Piers, for Foundations, for Footings in Basements. Bores pilot holes so Piling can be driven faster and without shaking down nearby Building Foundations. Bores through frost. Last February a large Telephone Company bored 16" holes through 2 to 3 ft. of frost in 8 to 10 minutes—with a 3 HP motor and without a pressure feed!

The illustration shows the Ka-Mo Drill boring through a Caisson which keeps loose dirt out of the hole, speeds up boring, and installation of Pipe, Tile, or Conduit. Drill and Caisson move forward as a Unit—much faster and easier than Jacking the Caisson ahead.

Ka-Mo Motor and Drill bores Vertical or Horizontal holes, *with or without* a Caisson. Boring costs far less than open Trenching. There's a big labor saving, little backfilling or damage to the ground surface.

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Pipe Line and Conduit Boring

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Quickly!

Easily!

Inexpensively!

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2. Thickness of Seam
3. Depth of Overburden

Model LD powered with a 12HP motor for depths to 300'.

Model LD powered with a 7HP motor for depths up to 150'.

For simplicity of design and operation you just can't beat the Acker LD. We've kept moving parts to a minimum and eliminated all feed gears or screws. (Elimination of unnecessary parts cuts down weight, too—an advantage when operating in isolated locations.)

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rebuilding bridges, flood gates, 60,000 acre Wildlife Refuge, Saginaw, Cass, Flint, Tittabawassee and Shiawassee Rivers, Saginaw, Flint, Vassar, Frankenmuth, Corunna, Owosso and Midland, $17,814,500.

B. C., New Westminster—Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., dredging in Fraser River during 1951. Approx. $580,000. T. Blais, c/o owner, engr.

AIRPORTS

▲† Ariz., Phoenix—AIR BASE IMPRVS.—U. S. Eng., 751 S Figueroa St., Los Angeles, Calif. imprvs. at Luke Air Force Base, for U. S. Air Force. $5,000,000.

▲† Ariz., Tucson—RUNWAY, etc.—U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif., 3 mi. 200 ft. wide runway, relocation 15 mi. railroad tracks, fuel storage facilities, communications center, instrument landing system at Davis-Monthan Air Force Base, for U. S. Air Force. $7,000,000.

▲† Calif., Oxnard—AIRSTRIP—U. S. Eng., 751 S. Figueroa St., Los Angeles, imprv. Camarillo airstrip, incl. runways, taxiways, bldgs., barracks, etc. $6,177,000.

† Ga., Valdosta—AIR FORCE BASE—U. S. Eng., P. O. Box 889, Savannah, reactivation of Air Force Air Base, known as Moody Field, near here. Approx. $500,000.

▲† Ill., Park Ridge—RUNWAYS, etc.—U. S. Eng., 520 Merchandise Mart, Chicago, 54, Ill., runways, navigation aids, hangars, barracks, dispensary, O'Hare Field, near here, for Dpt. Air Force, $5,703,000.

▲† Ill., Rantoul—AIRPORT EXPANSION—Dpt. Air Force, Pentagon Bldg., Wash., D. C., constr. and expansion Chanute Air Base, four 150 ft. wide, 5,000 to 6,300 ft. long runways; 160,200 sq. yd. apron area, with 25,000 gross load capacity, 69,000 sq. yd. taxi area. $7,424,000.

▲† Ill., Rantoul—BARRACKS, etc.—U. S. Air Force, Chanute Field, plans by Skidmore Owings & Merrill, 100 W. Monroe St., Chicago, Zone 3, 80 barracks and office bldg. and educational bldgs. $7,500,000.

▲† Ill., Scott Field—RUNWAYS, etc.—U. S. Eng., Merchandise Mart, Chicago, Zone 54, runways, navigation aids, barracks, hangars, dispensary, for U. S. Air Force, $10,157,000.

▲† La., Lake Charles—AIRPORT BUILDINGS—U. S. Eng., 606 Santa Fe Bldg., Galveston, Tex., plans by Bodman & Murrell, Reymond Bldg., Baton Rouge, and Brown & Bulter, foot N. Blvd., Baton Rouge, archts.-engrs., barracks, $2,000,000; warehouses, $850,000; mess halls, $750,000; hangars, $1,000,000; shops, $450,000; misc. construction, $1,792,000; rehabilitation existing bldgs., $750,000; fueling and storage sys., $300,000; runways, $1,000,000; taxiways, $1,250,000; water lines facilities, $150,000; sanitary and storm sewers, $200,000; street, road constr. imprvs., $250,000; grading, drainage, $300,000; outside lighting sys., rehabilitation and exten., $250,000, at Lake Charles Air Force Base. CD 3/20/8.

▲† Mich., Oscoda—AIRPORT IMPRVS.—U. S. Eng., 2015 Cadillac Tower, Detroit, Zone 26, airfield pavement, navigation aids, fuel facilities, hangars, control tower, operations bldg., communication facilities, barracks, at Oscoda Air Force Base. $1,974,000.

▲† Mich., Selfridge Air Force Base (Br. Mount Clemens)—AIRPORT IMPRVS.—U. S. Eng., 2015 Cadillac Tower, Detroit, Zone 26, airfield pavement, navigation aids, fuel facilities, hangars, operations bldg. and utilities. $1,218,000. CD 11/17.

▲† N. J., Wrightstown—AIRPORT IMPRVS.—U. S. Eng., First and Douglas Sts. N.W., Wash. 25, D. C., pavement, navigational aids, fuel facilities, hangars, barracks, control tower and utilities. $4,757,000.

▲† N. Y., Rome—AIRPORT IMPRVS.—U. S. Eng., First and Douglas Sts. N.W., Wash. 25, D. C., pavement, navigational aids, fuel facilities, hangar, barracks and test facilities at Griffin Air Force Base. $5,586,000.

▲† N. Y., Westhampton Beach—AIRPORT IMPRVS.—U. S. Eng., First and Douglas Sts. N.W., Wash. 25, D. C., pavement, navigational aids, fuel and communications facilities, hangars, barracks, fire station, dispensary and utilities at Suffolk County Airport. $2,280,000.

▲† N. Y., Wheatfield—AIRPORT IMPRVS.—U. S. Eng., First and Douglas Sts. N.W., Wash. 25, D. C., pavement, navigational aids, fuel and communication facilities, hangars, operations bldg., control tower, barracks, infirmary and utilities at Niagara Falls Airport. $3,332,000.

▲† Tex., Bryan—HANGARS, etc.—U. S. Eng., 606 Santa Fe Bldg., Galveston, hangars, $550,000; misc. constr., $1,000,000; warehousing, $650,000; outside lighting extens., facilities, $150,000; auxiliary airfield, $500,000; streets and roads, $300,000; water lines, facilities, $200,000; sanitary and storm sewers, $350,000; taxiways, runways, $2,500,000; academic bldgs., $500,000, CD 2/1; runway and taxiway extens. and partial runway lighting, rein.-con. $950,000, CD 3/21; aviation gasoline and fuel storage and dispensing system with above, below ground steel storage tanks, $175,000, CD 3/20, under LB. Stone & Pitts, 1872 Calder St., Beaumont, Tex., Carter & Burgess, Century Bldg., Fort Worth, Tex., Wm. E. Nash, Bryan, Tex., archts.-engrs.

† Tex., San Antonio—CONTROL BLDG.—U. S. Eng., 606 Santa Fe Bldg., Galveston, Kelly Air Force Base control bldg., Inv. No Eng 41-243-51-53. $100,000. CD 1/5.

▲† Wash., Everett—AIR BASE REHABILITATION, etc.—U. S. Eng., 4735 E. Marginal Way, Seattle 4, Wash., rehabilitation 9 bldgs. for readiness and brief-

(Continued on page 97)

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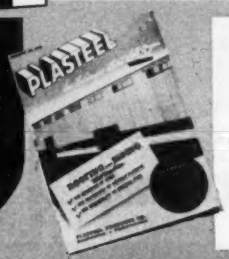

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a good investment for your city —from any angle

WHAT sort of an impression does your town make on the strangers who daily motor down its streets? Do they remember it as a modern, progressive looking city? Or did they get the impression that it was a pretty drab "burg" because its streets were still lined with ugly old-fashioned poles?

What the home folks think, is mighty important, too. Nothing will do more to boost their pride in the old home town than the replacement of obsolete, irregular poles with modern, good-looking tubular steel standards.

But an "up and coming" look is but one of the advantages you give your town through the adoption of steel standards for all street lighting, power lines, and other commercial pole purposes. And these other advantages (they're listed briefly in the column at the right) contribute just as much to the good reputation of a city.

In choosing new poles, you can make no better selection than NATIONAL Seamless Tubular Steel Poles. Every U·S·S NATIONAL Seamless Steel Pole is made by the seamless process . . . a solid billet of the finest quality steel is pierced to form the basic tube . . . there is no weld . . . no line of potential weakness . . . smooth, clean and trim looking. There's absolute uniform wall strength from end to end. For detailed information, write for Bulletin No. 14. Please address your requests to National Tube Company, Frick Bldg., Pittsburgh 19, Pa.

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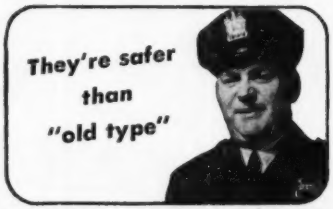
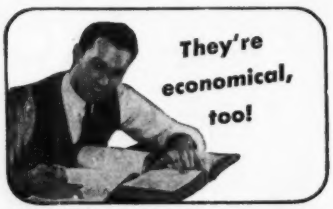
COLUMBIA STEEL COMPANY, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

CITY MANAGERS know that the first things businesses look for when considering a new location are signs of a town's progressiveness. Streets lined with smooth steel poles say yours is a live place!

LEADERS OF WOMEN'S CLUBS recognize the importance of beautification programs. They know, too, that no improvement contributes more to a town's good appearance than the replacement of all unsightly poles with modern steel standards.



POLICEMEN see first hand just how hazardous many old types poles are. If they had their way, every pole would be a steel pole . . . and there would be fewer of them. NATIONAL Seamless Steel Poles can be spaced at wider intervals. And they offer less visual obstruction.



PURCHASING AGENTS say steel poles go farther because they can be spaced at wider intervals. Thus fewer poles are required for a complete replacement job. They're easy to rig and erect with minimum manpower, and except for an occasional paint job, require no maintenance.

USS

NATIONAL *Tubular* STEEL POLES

UNITED STATES STEEL

(Continued from page 94)

ing facilities alert hangar, barracks, runway exten., landing sys. and lighting facilities at Paine Air Force Base, $1,750,000.

▲† Wash., Seattle — TRAINING CENTER — Dpt. Air Force, Pentagon Bldg., Wash., D. C., reserve training center at Boeing Field. $2,500,000.

▲† Wis., Madison—TRUAX FIELD IMPRVS.—U. S. Govt., 428 Federal Bldg., Milwaukee, 1, imprvs. at Truax Field. $1,500,000. John J. Flad & Assocs., 908 W. Johnson St., Madison, and Mead & Hunt, 550 State St., Madison, consult. engrs.

▲ Wis., Milwaukee—TERMINAL BLDG.—Milwaukee Co., Courthouse, plans by J. Messmer, c/o owner, terminal bldg. at General Mitchell Field. $2,600,000-$2,800,000. L. F. Fisher, South Bend, Ind., consult. engr. T. F. Cosgrove, c/o owner, engr. CD 11/19/49.

LATIN AMERICA

Mexico, Mexico City—Mexico Chain Co., S. A. Motolinia, 41-303 Mexico City, plans gold and silver bracelets factory. $250,000.

Mexico, Monclova—Mexican Govt., Bank of Mexico, 5 de Mayo, 2, Mexico City, plans coke plant. $5,780,000.

Mexico, Neuvo Laredo—Junta Federa de Mejoras Materiales (Federal Better Works Board), Neuvo Laredo, Tampaulipas, Mexico, plans 300-bed general civil hospital. $750,000.

Mexico, Tuxtla Gutierrez—Mexican Govt., Srio. de Cy O.P. (Lic. Augustin Garcia Lopez, sec.), Mexico City, plans airport. $1,500,000.

PUBLIC BUILDINGS

Ariz., Tempe—STUDENT UNION—Arizona State College, Tempe, plans by Kemper Goodwin, Tempe, student union bldg. $750,000. CD 1/28/49.

Calif., Firebaugh—SCHOOL—Firebaugh Joint School Dist., Howard P. Crocker, supt., plans by Swartz & Hyberg, Rowell Blvd., Fresno, school. $993,998.

▲ Calif., Sacramento—EMPLOYMENT—State, P. Wks. Bldg., Sacramento, Calif., plans by Harry A. Thomsen, Jr., and Alec. L. Wilson, 315 Montgomery St., San Francisco, Calif. State Employment Department Bldg. $7,000,000.

Calif., Santa Clara—SCHOOLS—Jefferson Union School Dist., 934 Hillmar St., plans by Kress & Gibson, First National Bank Bldg., San Jose, 2 schools, $577,860. CD 2/14.

Calif., Vacaville—SCHOOL—Vacaville Union High School Dist., Lemone E. Williams, supt., Vacaville, plans by Leonard F. Starks, Native Sons Bldg., Sacramento, high school, $460,500.

▲ Fla., Panama City—HOUSING—Panama City Housing Auth., c/o Pearson, Tittle & Narrows, archts., First National Bank Bldg., Montgomery, 200 housing units. Approx. $1,500,000.

▲ Ill., Alton—HOUSING—Madison County Housing Auth., 3 and Haller Sts., East Alton, plans by Friedman, Alschuler & Sincere, 223 W. Jackson St., Chicago, Zone 6., 400-family housing. $4,000,000.

▲ Ill., North Chicago—SCHOOLS—School Dist., 64, 110 18 St., plans by Fisher & Bryan, 79 W. Monroe St., Chicago, Zone 3, two schools, $1,500,000.

Ill., Skokie—SCHOOL—Bd. Educ., School Dist., 69, plans by Alfred P. Allen, 225. N. Michigan Ave., Chicago, Ill., Lincoln School, $500,000.

Ind., Muncie—SCHOOL—School City, High and Adams Sts. plans by Eugene Hamilton, Western Reserve Bldg., brick, steel Emerson School addn. $300,000.

▲ Ia., Burlington—PLANT—Iowa Ordnance Plant, Burlington, concrete blockhouses and reactivation of plant. $1,000,000.

▲ Kan., Parsons—SCHOOL—School Bd., voted bonds Mar. 20, 3 schools, $1,450,000. CD 5/23/50.

▲† La., New Orleans—STORAGE FACILITIES—U. S. Eng., 606 Santa Fe Bldg., Galveston, Tex., plans by Rosenthal, Kessels, Jones-Godat & Assoc., Balter Bldg., bulk storage bldg. units facilities. $1,500,000.

▲† Md. Bainbridge—BUILDINGS—Dpt. Navy, Bureau Yards & Docks, 18 St. and Constitution Ave. N.W., Wash., D. C., 2nd Stage, alterations, repairs to all trade buildings. $7,000,000.

▲ Mich., Ann Arbor—ATHLETIC—University of Michigan, Bd. Regents, plans by Lee & Kenneth C. Black, 706 Capitol Savings & Loan Bldg., Lansing, and Alden B. Down, Midland, co-ed athletic bldg., incl. swimming pool. North University, Forest and Geddes Aves. $2,500,000. CD 1/26/50.

▲ Mich., East Detroit—SCHOOLS—Bd. Educ. plans by Lowell M. Price, 605 W. 11 Mile Rd., Royal Oak, 2 story, bsmnt., brick, steel, concrete Junior High School, $750,000; brick, steel school, $600,000; brick, steel Junior High School. $750,000. CD 1/26/49.

Mich., Ludington—HOUSING—City, City Comn., City Hall, 46 brick public houses. $475,000.

Mich., Traverse City—COMMUNITY COLLEGE—City, Dr. Glen Loomis, supt., plans by Traverse City Architects Associated, Traverse City, brick, steel, community college. $500,000. CD 2/13.

▲ Mo., St. Louis—SCHOOL—Bd. Educ., V. Harry Rhodes, comr., 911 Locust St., Zone 1, bond election May 1, school addns. $17,230,000.

N. M., Hobbs—HIGH SCHOOL—Bd. Educ., Hobbs, high school. $600,000. Vorhees & Standardt, 1607 W. 2 St., Roswell, consult. engrs.

▲ N. C., Kinston—HOSPITAL—Lenoir County Hospital, Kinston, plans by J. N. Pease & Co., 119½ E. 5

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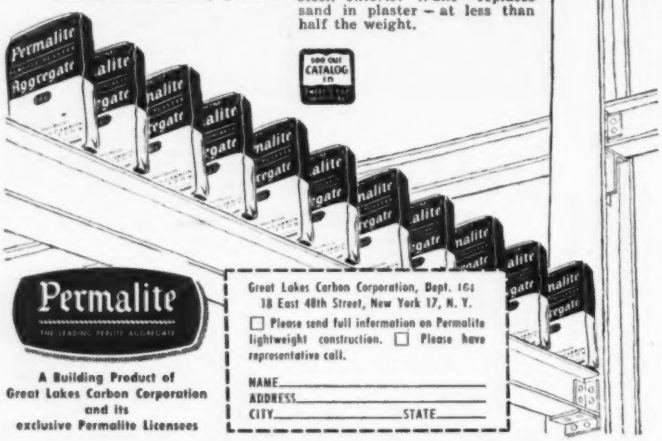

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St., Charlotte hospital expansion. $1,000,000. CD 6/19.

▲ Ore., Portland—HOSPITAL—State Bd. Control, Capitol, Salem, 500-room hospital for aged and feebleminded. $3,000,000.

▲ Tenn., Memphis—CHEMISTRY—University of Tennessee, Medical Center, 874 Union Ave., plans by Walk C. Jones-Walk C. Jones, Jr., 1215 Poplar St., 2 three story chemistry bldg., pharmacy bldg., steel, concrete constr. $4,800,000.

Tex., Dumas—SCHOOL—Dumas Independent School Dist., Dumas, plans by Macon O. Carder, 419 Fisk Bldg., Amarillo, school. $468,755.

Tex., San Antonio—HIGH SCHOOL—Harlandale Independent School Dist., W. Huff St., plans by Adams & Adams, Box 283, Terrell Wells, (San Antonio), brick, hollow tile, concrete, steel high school, pier and beam conc. fdn. $990,000.

Tex., Snyder—SCHOOLS—Snyder Consolidated Independent School Dist., Snyder, plans by Buford & Feinberg, 326 Iteruban Bldg., Dallas, Negro School, $325,000; administration bldg., $300,000.

Wis., Wilmot—SCHOOL—School Dist., Wilmot, high school addn. $400,000.

▲† Alaska, Bethel—HOSPITAL—Alaska Native Service, Dpt. Interior, Interior Bldg., 19 and C Sts., Wash. 25, D. C., hospital. $3,500,000.

Alta., Camrose—SCHOOL—Camrose School Dist., Camrose, rebuilding brick veneer Camrose High School addn. $477,233. CD 2/7/46.

▲ B. C., New Westminister—HIGH SCHOOL—New Westminister School Bd., New Westminister, frame, stucco high school, $1,300,000.

Ont., Cobourg—SCHOOL—Cobourg Public School Bd., H. Field, secy., Cobourg, 15-room school, on Corey lots. Approx. $425,000.

▲ Que., Quebec City—HOSPITAL—General Hospital, 191 Blvd. Langelier, Quebec City, plans by L. Turcotte, 37 de la Couronne St., 5 story, rein.-con., stone, General Hospital for Incurables wing. Approx. $1,500,000. CD 4/2/46.

COMMERCIAL BUILDINGS

Calif., Belmont—COLLEGE—Sisters of Notre Dame, 300 Fulton St., Redwood City, plans by Vincent Raney, 233 Post St., San Francisco, Notre Dame College, $800,000. CD 5/24/49.

Colo., Denver—OFFICE—Shaner Brothers, 17 and Welton Sts., 12 story office. $500,000. Raymond Harry Ervin & Assocs., Patterson Bldg., Denver, Colo., consult. engrs. and archts. CD 6/14/45.

▲ Ill., Bellwood—OFFICES, etc.—Public Service Co. of Northern Illinois, 72 W. Adams St., Chicago, Zone 3, branch offices and yard for gas division 40 acre site, storage and service, $1,300,000.

▲ N. J., Franklinville—APARTMENT DEVELOPMENT—Joseph Shur, 21 Price St., West Linden, plans by Paul Trapani, 640 Burke Ave., Bronx, New York, N. Y., apartment development, Hawthorne Dr., Franklin Twp. $1,000,000.

▲ N. Y., Douglaston—HOUSES—Norqueen Realty Corp., c/o Benjamin Braunstein, archt., 163-18 Jamaica Ave., Jamaica, N. Y. 42 two story houses, on site bounded by Horace Harding Blvd., Douglaston Parkway, 61 Ave. and Marathon Parkway, $6,000,000.

▲ N. Y., Flushing—APARTMENTS—Mitchell Gardens No. 3 Corp., c/o Benjamin Braunstein, archt., 153-18 Jamaica Ave., Jamaica, 14 six story apartments, bounded by Union St., Whitestone Bridge Approach and 25 and 30 Aves. $5,797,200.

N. Y., New York—CHURCH SCHOOL—Grace Church in New York, 802 Broadway, Zone 3, plans by John C. B. Moore, 215 E. 37 St., Zone 16, private church school alterations, 84-88 Fourth Ave. $300,000.

▲ N. Y., Rego Park—APARTMENT—Lakeville Norton Blvd. Corp., c/o George Miller, archt., 67 W. 44 St., New York, Zone 18, 6 story apartment, 99 Rd. between 64 Ave. and 64 Rd. $1,000,000.

N. C., Raleigh—HOSPITAL—St. Agnes Hospital, Oakwood St., plans by J. N. Pease & Co., 119½ E. 5 St., hospital addn. Approx. $500,000.

▲ Tex., Fort Worth—HOSPITAL—Harris Hospital, 1300 W. Cannon St., 250-bed hospital addn. $2,000,000.

Tex., Freeport—APARTMENT—Howard Moore & Thomas A. Greacen, 1010 Winbern St., Houston, plans by Thomas A. Greacen, 1010 Winbern St., Houston, 15 four-unit frame, masonry apartments, concrete slab fdn. $450,000.

Tex., Houston—COMMERCIAL—Wesley West, Sterling Bldg., commercial bldg., near W. Gray Ave. $500,000.

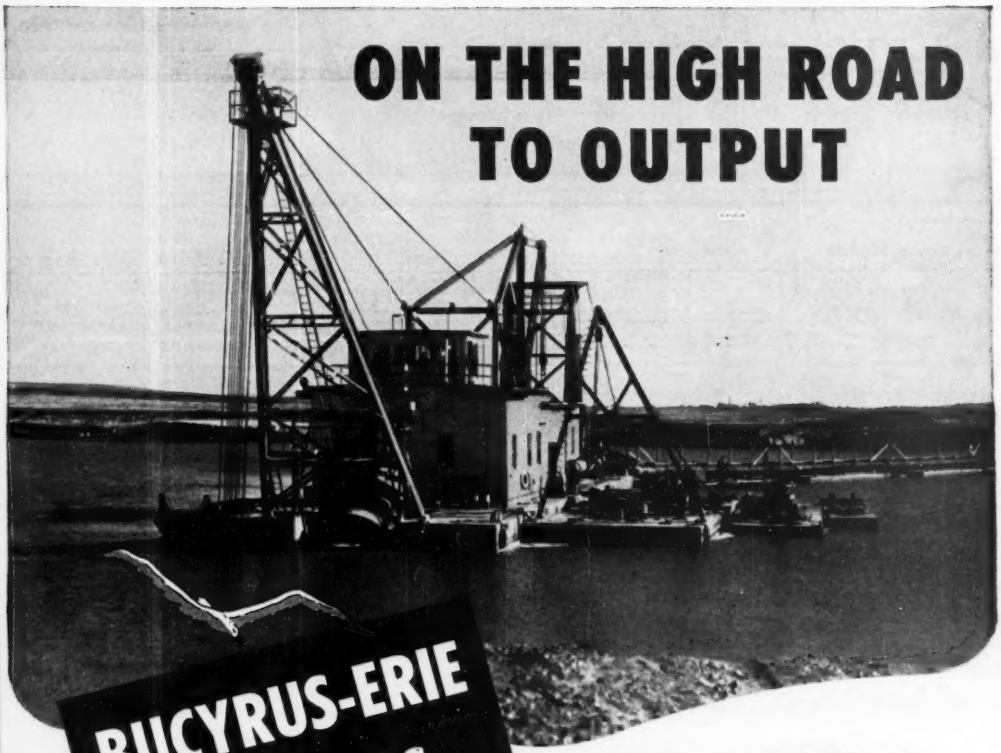
▲ Wis., Milwaukee—LIBRARY—Marquette University, 615 N. 11 St., Zone 3, plans by Brimeyer, Greflinger & Rose, 757 S. Broadway, Zone 2, 4 story medical library, $600,000; 4 story dental library, $500,000. CD 2/4/49.

B. C., Vancouver—HOSPITAL WING—St. Vincent's Hospital, 31 Ave. and Heather St., plans by Gardner & Thornton, 1664 W. Broadway, 100-bed hospital wing. $900,000.

Ont., Hawkesbury—HOSPITAL—Grey Nuns of the Cross, Sussex St., Ottawa, plans by L'Leblanc, 42 Rideau St., Ottawa, 75-bed, 4 story, brick, stucco hospital, Approx. $500,000.

▲ Ont., Ottawa—OFFICE—Metropolitan Life Insurance Co., Wellington St., 2 story, steel, brick, stone present Canadian Head Office addn., Wellington Bank and Sparks Sts. Approx. $1,000,000.

(Continued on page 101)



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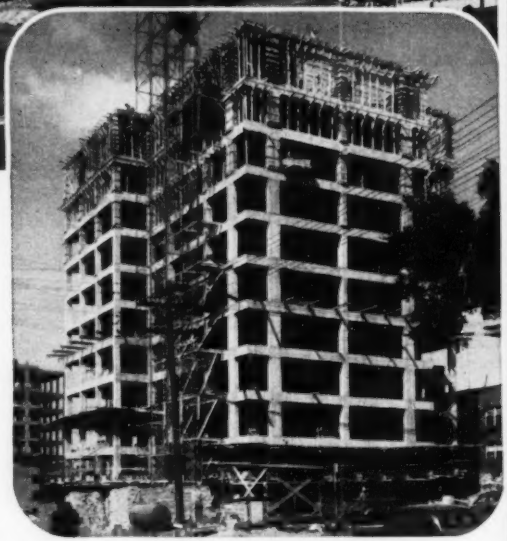

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▲ **Que., Riviere Du Moulin**—HOUSES—Louis de G. Belley, 255 Racne St., Chicoutini, 300 houses, Approx. $2,500,000.

INDUSTRIAL BUILDINGS

▲ **Ariz., Phoenix**—PLANT—Hughes Tool Co., Gulf Bldg., Houston, Tex., guided missiles plant, on 160 acre site. $50,000,000.

Ark., Dumas—PLANT—W. H. Rice & Others, Dumar, Ark., rice drying plant. $450,000.

Calif., Oakland—PLANT—Kaiser-Fraser Corp., Oakland Aircraft Div., Willow Run, Detroit, Mich., 1 story 50,000 sq. ft., plant addn., $500,000.

Colo., Greeley—POWER PLANT FACILITIES EXPANSION—Home Light & Power Plant, Greeley, expansion facilities at power plant, $440,000.

Conn., Plainfield—FACTORY—Trumbull Elec. Mfg. Co., 41 Woodford Ave., factory, $750,000. Lockwood Greene Engineers, Inc., 10 Rockefeller Plaza, New York, N. Y., consult. engr.

▲ **Fla., Port St. Joe**—PLANT—Kraft Container Board Co., Port St. Joe, plant expansion. $24,011,000.

Ill., Harvard—FACTORY, etc.—Butcher Boy Cold Storage Door Co., 170 N. Sangamon St., Chicago, plans by Andrew E. Kuby, 109 Benton St., Woodstock, Ill., factory and office, $300,000.

▲ **Ill., Skokie**—PLANT—Jannette Mfg. Co., 7405 N. Cicero St., mfg. plant. $1,000,000.

▲ **Ind., Anderson** — PLANT—Willys-Overland Motors Inc., Administration Bldg., Wolcot Bl., Toledo, O., plant remodeling, 16 and Locust Sts.

▲ **Ind., Gary**—PLANT—Taylor Forge & Pipe Corp., 4735 W. 14 St., Chicago, Ill., branch plant on Dunes Highway. $1,500,000.

Ind., Muncie—PLANT—Goodyear Tire & Rubber Co., 1144 E. Market St., Akron, O., plant addn. south of here, $396,698.

Ia., Dubuque—PLANT—John Deere Dubuque Tractor Works, Peru Rd., 2 plant bldgs. $750,000.

▲ **Kan., Riverton**—POWER STATION—Empire District Electric Co., Joplin, power station addns. $7,000,000.

▲ **La., Lake Charles**—PLANT—Continental Oil Co., Oil & Gas Bldg., Houston, Tex., modern refinery plant. $10,000,000.

Md., Baltimore—WAREHOUSE—Wm. B. Reilly & Co., 118 E. Pratt St., 100x200 ft., cinder block, steel, concrete coffee warehouse in Baltimore Harbor area.

▲ **Mich., Battle Creek**—MANUFACTURING UNIT—Clark Equipment Co., George Spatta, pres., Battle Creek, 1 story, 360x560 ft., brick, steel industrial tractors mfg. unit addn. $2,000,000.

Mich., Buchanan—PLANT—Clark Equipment Co., George Spatta, pres., Battle Creek, 1 story, 100x900 ft., brick, concrete plant addn. $700,000. (Correction—cost). CD 3/2.

▲ **Mich., Livonia**—PLANT—Ford Motor Co., 3000 Schaefer St., Dearborn, 1 story tank mfg. plant, 2 story admin. bldg. $15,000,000. Albert Kahn Associated Architects & Engineers, Inc., 345 New Center Bldg., Detroit, consult. engr.

▲ **Mich., Utica**—PLANT—Packard Motor Car Co., Hugh J. Ferry, pres., 1580 E. Grand Blvd., Detroit, J-47 jet engine plant, incl. rein.-con. warehouse, assembly and test unit on 55 acre site, Utica Proving Grounds.

▲ **Mo., Herculaneum**—LEAD SMELTER—St. Joseph Lead Co., Herculaneum, addns., imprvs. to lead smelter, incl., slab zinc furnace, $3,000,000; opening 2,000 ton daily lead and zinc mine in Washington Co., $5,500,000; construct 2,000 ton zinc float plant, equip., modernization Federal Mill, underground works in Hayden Creek area southeastern Missouri. $2,000,000.

Tenn., Chattanooga—BAKERY—Colonial Baking Co., 2220 E. 4 St., plans by Bianculli, Palm & Purnell, 501 Cherry St., bakery addn. $600,000.

▲ **Tenn., Memphis**—REFINERY—Delta Refining Co., W. Mallory Ave., refining plant. $1,720,000.

▲ **Tenn., Memphis**—PLANT—Missouri Farmer Association (Delta Refining Co., W. Mallory Ave., Memphis, Tenn.), Columbia, Mo., petroleum plant, to produce aviation gas and like products. $1,720,000.

▲ **Tex., Bishop**—PLANTS—Celanese Corp. of America, 180 Madison Ave., New York, N. Y., chemical plant, $8,500,000; chemical plant expansion, $2,500,000.

Tex., Houston—PLANT—Goodyear Synthetic Rubber Co., LaPorte Rd., plant alterations. $400,000.

▲ **Tex., Houston**—GENERATING UNITS—Houston Lighting & Power Co., 1016 Walker St., Houston, electric power generating units, Proj. No. 1, $12,000,000; Proj. No. 2, $9,500,000; Proj. No. 3, $9,900,000. CD 5/20/49.

▲**Tex., Tyler**—STEEL MILL—Syndicate, c/o Carl L. Estes, Longview, steel mill, near here. $9,500,000.

Va., Front Royal—PLANT—American Viscose Corp., Front Royal, plant addn. Approx. $100,000.

Va., Roanoke—PLANT—American Viscose Corp., 1714 9 St., S. E., plant addn. Approx. $100,000.

▲ **Wash., Port Angeles**—PLANT—National Plywood Co., Inc., Port Angeles, plywood plant at Lake Pleasane 40 mi. west of here, $1,200,000.

Wash., Seattle—PLANT—United Concrete & Pipe Corp., Box 425, Baldwin Park, Calif., concrete pipe mfg. plant, $500,000.

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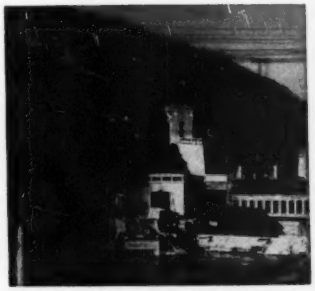

Illustration shows Sauerman Tautline Cableways working on Chastang Dam. Two identical machines with spans of 1146 ft. and conveying speeds of 1300 f.p.m., handle all the materials going into this dam. Mixed concrete is handled in 8 cu. yd. dump buckets; other materials in skips and slings.

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Wash., Tacoma—WHOLESALE BLDG.—W. P. Fuller & Co., 3301 S. Lawrence St., paint mfg. and wholesale bldg., $146,400.

W. Va., Nitro—PLANT—American Viscose Corp., Nitro, plant addn. Approx. $100,000.

▲ W. Va., Parkersburg — PLANT — Libbey-Owens-Ford Glass Co., Nicholas Bldg., Toledo, O., fiber glass plant, $2,000,000.

▲ Wis., Cassville—STEAM GENERATING PLANT—Dairyland Power Co-operative, 307 Rivoli Bldg., LaCrosse, steam generating plant. $30,000,000 Verne E. Alden, 120 S. LaSalle St., Chicago 3, Ill., consult. engr.

▲ Alta., Edmonton—PLANT—Canadian Chemical Co. Ltd., c/o Celanese Corp. of America, 180 Madison Ave., New York, N. Y., U.S.A., chemical plant on 320 acre site 7 mi. east of here. $40,000,000. Main, Rensaa & Minos, MacCosham Bldg., Edmonton, consult. engrs.

▲ Que., La Malbaie—PLANT IMPRVS., etc.—Donohue Brothers Ltd., 51 des Jardins St., Quebec City, plant imprvs., replacements. $1,600,000.

UNCLASSIFIED

Calif., Los Angeles—MUSEUM WING—Bd. Supervs., Los Angeles Co., 501 Hall of Records, plans by Spaulding & Rex, 3305 Wilshire Blvd., west wing addn. to County Museum. $400,000. C. G. DeSwarte, 3305 Wilshire Blvd., consult. engr.

▲ Calif., Roseville—YARD—Southern Pacific R.R., Market St., San Francisco, new car classification yard north of Sacramento. $4,500,000.

Ga., Savannah—TV STATION, etc.—WSAV, Liberty National Bank Bldgs., TV station and tower. Approx. $100,000.

▲ Md., Baltimore—ORE PIER—Baltimore Port & Terminal Corp., First National Bank Bldg., ore pier. $5,000,000.

Mich., Detroit—TRAFFIC CONTROL—City, Mayor Cobo, City Hall, modernize 140 signalized intersections downtown loop, $288,000; 40 new high priority intersections, $160,000; protect 26 school crossing intersections, $120,000; modernize traffic lights on Jefferson Ave., $61,000; 12 new intersectional and mid-block lights 12 and 14 Sts., $36,000; modernize Davison Ave. lights, $70,000, Alger F. Malo, City Hall, traffic engr.

Missouri — RURAL DISTRIBUTION LINES — Southwest Electric Co-operative, Bolivar, 333 mi. rural distr. lines, headquarters, sys. imprvs., Polk Co. $975,000 REA loan approved. Erwin Davis, Bolivar, owner's engr. Frank Horton & Co., Lamar, consult. engrs. CD 2/5.

New Mexico—RURAL DISTRIBUTION LINES—Farmers Electric Co-operative, Clovis, 244 mi. distr. lines, sys. imprvs. and completing previously approved constr., Curry Co. $360,000. REA allot. Tynes & Loftin, Korber Bldg., Albuquerque, consult. engr. Charles Gilbert, c/o owner, engr. CD 2/14/50.

† R. I., Newport—TORPEDO STATION—Pub. Wks. Office, Naval Base, Newport, torpedo station repairs, Coddington Cove. $135,000.

▲† Tenn., Millington—MILITARY INSTALLATION—Bureau Yards & Docks Annex, Navy Dpt., Arlington, Va., plans by Wyatt C. Hedrick, 1st Natl. Bank Bldg., Fort Worth, Tex., military installation, $50,000,000.

Texas—OIL PIPE LINE—Tex-Harvey Pipe Line Co., Midland, Tex. 56 mi. 6- to 12-in. trunkline pipe line, near Midland. $560,000.

† Wash., Seattle—SPRINKLER SYSTEM—U. S. Eng., 4735 E. Marginal Way, Seattle, 4, Wash., sprinkler sys. on Pier 38 and 39 at Port of Embarkation. $500,000.

Que., Quebec City—HARBOUR IMPRVS., etc.—Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., harbour imprvs. at Cap des Rosiers, Rivere Whalen, Approx. $28,000; dredging in harbour at Amherst Island, $133,000; breakwater-wharf at Pointe St. Pierre, $187,000. R. Blais, c/o owner, engr.

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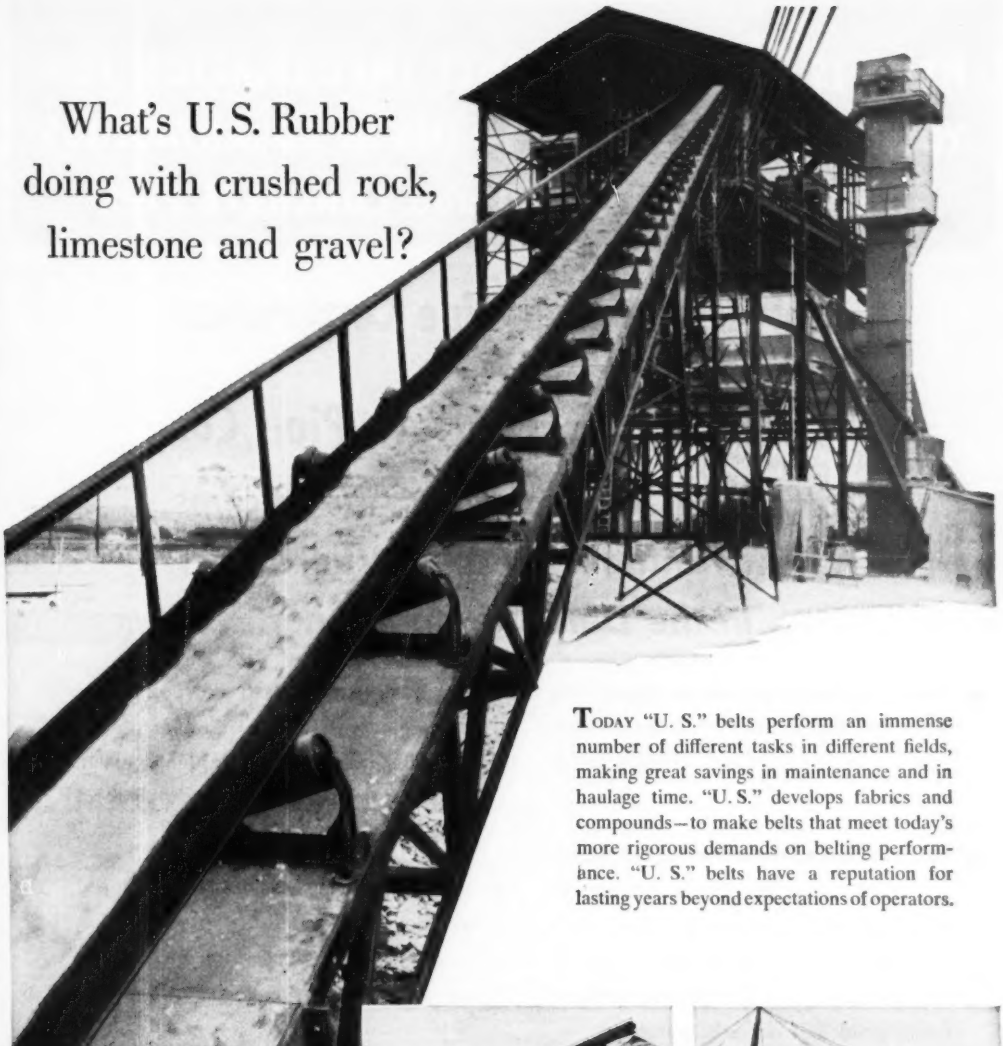

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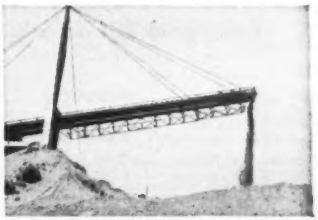

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CONSTRUCTION REPORTS-Second Section

NEW ENGLAND

BIDS ASKED—BUILDINGS

▲ **Mass., Revere**—HOUSING—B.A. 4/18—City of Revere Housing Auth., J. L. Meehan, chn., veterans' housing Proj. PHA 14-1, Rose and Hutchinson Sts. and Stanton Ave. $1,100,000. Plans deposit $100. Turiello Assoc., 507 Broadway, archts. CD 9/28/48.

Conn., Darien — SCHOOL — B.A. About 4/20 — Town, S. P. Marland, supt., Town Hall, Senior High School addn., Renshaw Rd. $660,000. Plans deposit $25. CD 3/20.

LOW BIDDERS—BUILDINGS

▲ **Wexler Constr. Co.**, 2 Elm Pl., Brookline, Mass. Low Bidder. Base Bid 1. brick veneer bldg., steel sash, $1,055,000, aluminum sash, $1,015,000, wood sash, $998,500; Base Bid 2, wood frame bldg., steel sash, $978,000; aluminum sash, $998,000, wood sash, $973,000; Base Bid 3 cement brick bldg., steel sash, $997,800, aluminum sash, $1,008,000, wood sash, $992,800, Conn. 10-1, low rent HOUSING, incl. 100 housing units, Harrington Ave., WILLIMANTIC, CONN. City Housing Auth., Harrington Ave., Willimantic, Conn. Bids Mar. 28. CD 3/13.

▲ **A. E. Stephens Co.**, 1200 Main St., Springfield, Mass. Low Bidder. $1,937,900. HIGH SCHOOL, Sage Park, Capen St., WINDSOR, CONN. Town, Town Hall, Windsor, Conn. Bids Mar. 27. CD 2/28.

CONTRACTS—BUILDINGS

▲ **Turner Constr. Co.**, 420 Lexington Ave., New York, N. Y., Contract Awarded. $10,000,000 aircraft gas-turbine engine parts PLANT, NORTH HAVEN, CONN. Pratt & Whitney Div., United Aircraft Corp., 400 Main St., East Hartford, Conn. Albert Kahn Associated Architects & Engineers, Inc., 345 New Center Bldg., Detroit, Mich., archt. and engr.

▲ **Turner Constr. Co.**, 420 Lexington Ave., New York, N. Y., Contract Awarded, $10,000,000, propeller blade PLANT at Bradley Field, WINDSOR LOCKS, CONN. Hamilton Standard Div., United Aircraft Corp., 400 Main St., East Hartford, Conn. Albert Kahn Associated Architects & Engineers, Inc., 345 Ne Center Bldg., Detroit, Mich. archt. and engr.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
STREETS AND ROADS
April 24
New Jersey

BIDS ASKED—BUILDINGS

N. Y., Garden City—SCHOOL—B.A. 4/17—Bd. Educ., Union Free School Dist. 18, Hempstead Twp., Garden City, Stratford School addn., alterations. $500,000.

LOW BIDDERS—HEAVY CONSTRUCTION

▲ **Bethlehem Steel Co.**, E. 3 St., Bethlehem, Pa., Low Bidder, $1,053,455. Contr. 55, furnishing del. approx. 24,700 lin. ft. 72 in. inside diam. pipe in Wanaque and Pompton Lakes Boros, Passaic Co. WANAQUE, N. J. North Jersey District Water Supply Comn., Wanaque, N. J. Bids Mar. 14. CD 3/8.

▲ **Consolidated Constr. Co.**, 810 Haddon Ave., Collingswood, N. J. Low Bidder, $1,456,000, secondary sewage treatment plant, EASTON, PA. Easton Authority Bd., Easton, Pa., Ivan M. Glace, 1001 N. Front St., Harrisburg, Pa., engr. CD 2/27, under LB.

▲† **Cramer Vollmerhausen Co.**, 2601 Connecticut Ave. N.W., Wash., D. C. Low Bidder. $1,275,000, est. $2,000,000. 50x140x180 ft., 194,000 cu. ft. submarine propulsion test facilities, Naval Engineer Experimental Station, non-machinery test bldg., Fuel Storage Bldg. 2, ANNAPOLIS, MD. P. Wks. Office, U. S. Naval Academy, Annapolis, Md. Bids Mar. 29. CD 3/21.

▲ **Baton Constr. Corp.**, 1717 Sansom St., Phila., Pa., Low Bidder. $2,832,600. water filtering plant, WILMINGTON, DEL. Wilmington Bd. Water Comrs., Wilmington, Del. Bids Mar. 7. CD 2/21.

▲ **Utilities Constr. Co.**, Lutherville, Md. Low Bidder. $1,249,238. Contr. 3, 9,500 ft. 72 and 84 in. concrete pipe, and 9,000 ft. 8- to 16-c.i. water mains, WILMINGTON, DEL. City, City Hall, Wilmington, Del. Bids Mar. 13. CD 2/16.

CONTRACTS—BUILDINGS

▲ **John T. Brady & Co., 606 W. 47 St.**, New York 19, N. Y. Contract Awarded. $2,892,840. general constr. ***Almiral & Co., Inc., 53 Park Pl., New York, N. Y., $717,237, heating and ventilating***E. A. Kahn & Co., 163-18 Jamaica Ave., Jamaica, N. Y., $580,000, electrical work for Queens General HOSPITAL, JAMAICA, N. Y. Dpt. P. Wks., Municipal Bldg., New York 7, N. Y. Grand total $4,190,077. Bids Feb. 15. CD 2/26, under LB.

▲ **E. I. du Pont de Nemours & Co.**, du Pont Bldg., Wilmington, Del. Own Forces. $1,000,000. PLANT addn., DEEPWATER POINT, N. J.

▲ **Sessinghaus & Osterguard**, 115 Peach St., Erie, Pa. Contract Awarded. $2,000,000. 125x228 ft., asbestos, masonry, steel frame POWER PLANT addn., 100 ft. high, ERIE, PA. Pennsylvania Electric Co., Johnstown, Pa. Gilbert Assoc., Inc., 412 Washington St., Reading, engr. CD 4/3/50.

▲ **George A. Fuller & Co.**, 1138 Mumsey Bldg., Wash, 4, D. C. Contract Awarded. $2,000,000. APARTMENT, 2311-35 N. Front St., HARRISBURG, PA. Riverview House, Inc., 2312-35 N. Front St., Harrisburg. Gibson & Kline, Architects Bldg., Phila., Pa., engrs. Edwards & Brown, Broadway at Carman St., Camden, N. J., archts.

▲ **Paddock Farms**, Huntingdon Valley, Pa. Separate Contracts. Approx. $1,187,500. RESIDENTIAL DEVELOPMENT, Paddock Rd., HAVERTON, PA. Harold E. Williams, 2012 Walnut St., Phila., Pa., archt.

▲ **Stone & Webster Engineering Corp.**, 49 Federal St., Boston, Mass. Contract Awarded. $7,000,000. Gas STORAGE PLANT, ROCKVILLE, MD. Washington Gas Light Co., 11 and H Sts. N. W., Wash., D. C.

SOUTH

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
April 17 — Virginia
April 20 — Kentucky
STREETS AND ROADS
April 17 — Virginia
April 18 — Louisiana
April 20 — Kentucky

BIDS ASKED—BUILDINGS

Ky., Ashland—HOSPITAL—B.A. 4/17—Kings Daughters Hospital, Unit A, 71x109 ft., Unit B, 50x94 ft. addn. to hospital. $800,000. Mueller, Hair & Hetterich, Anthony Wayne Bldg., Hamilton, O., archts. CD 6/30.

LOW BIDDERS—HEAVY CONSTRUCTION

▲ **Lynchburg Foundry Co.**, Lynchburg, Va. Low Bidder. $1,283,043, approx. 100 mi. pipes and fittings*** **Mueller Co.**, 2501 Chestnut St., Chattanooga, Tenn., $185,515, valves and fire hydrants, for water sys. exten., ROANOKE, VA., City, City Hall, Roanoke, Va. Bids Mar. 22. CD 3/16.

† **U. S. Eng.**, 606 Santa Fe Bldg., Galveston, Tex. cancelled bids to have been opened Mar. 22, rehabilitation 155 army camp bldgs., Lake Charles Air Force Base, Inv. Eng. 41-243-51-37, LAKE CHARLES, LA. $795,000. Will re-advertise. CD 3/13.

LOW BIDDERS—BUILDINGS

State of Virginia, Richmond, Va., rejected bids Feb. 16, 3 story colonial type DORMITORY at College of William and Mary and 2 other bldgs., WILLIAMSBURG, VA. L. B. $868,500. CD 2/21, under LB.

▲ **Southeastern Constr. Co.**, Peoples Bldg., Charleston, W. Va. Low Bidder. $3,174,860, 4 story bsmnt., T-shaped, 278x44x122 ft. brick, block, steel city HOSPITAL, WEIRTON, W. Va. City, City Hall, Weirton, W. Va. Bids Mar. 27. CD 3/14.

Ray M. Lee Co., 1004 Edgewood Ave. N. E., Atlanta, ROME, GA. Rome Housing Auth., Rome, Ga. Bids Mar. Ga. Low Bidder, $878,731, 100 HOUSING UNITS, 29. CD 3/5.

CONTRACTS—HEAVY CONSTRUCTION

▲ **W. M. McIntosh, Inc.**, Staples Mill Rd., Richmond, Va. Contract Awarded, $489,436; **Adams & Tate Constr. Co.**, 2724 Roanoke Ave., Norwich, Roanoke, Va., $846,654; Powell & Bolling, Sandston, Va., $445,450; **Walter N. Webber**, Lynchburg, Va., $121,640; **Thompson-Arthur Constr. Co.**, Greensboro, N. C., $204,089; **Virginia Asphalt Paving Co., Inc.**, 437 McClanahan St. S.W., Roanoke, Va., $205,328; **Burton P. Short & Son**, Petersburg, Va., $389,248; **Short & Thompson**, Hopewell, Va., $223,795, and **Sam Finley, Inc.**, 1615 Cleveland Ave. S.W., Roanoke, Va., $258,118 for furnishing, applying 9,340,000 gal. bit. materials and 386,696 tons gravel or stone chips for covering material, VIRGINIA. State Hy. Dpt., Richmond, Va. Grand total $3,183,758. Bids Mar. 8. CD 2/23.

† **Duval Eng. & Contg. Co.**, 1746 E. Adams St., Jacksonville, Fla., Contract Awarded. $997,031, paving 21 mi. at guided missile base near COCOA, FLA. U. S. Eng., 575 Riverside Ave., Jacksonville, Fla. CD 5/24/49.

CONTRACTS—BUILDINGS

▲ **E. L. Daniels Co.**, 2112 N. Quincy St., Arlington, Va. Contract Awarded. $1,127,197. Washington-Lee Senior HIGH SCHOOL, ARLINGTON, VA. Arlington County Public Schools, Court House, Arlington, Va. Bids Mar. 10, awarded Apr. 2. CD 3/20, under LB.

Dewey G. Weddle & Co., National Bank of Commerce Bldg., Norfolk, Va. Contract Awarded. $949,000, general constr. Low Rent HOUSING Community No. VA 6-5, NORFOLK, VA. Norfolk Redevelopment & Housing Auth., Dickson Bldg., Norfolk, Va. Bid Feb. 14. CD 2/26, under LB.

Edward M. Fleming Constr. Co., 3304 N. Miami Ave., Miami, Fla. Contract Awarded. $937,188, Jackson Memorial HOSPITAL addn., MIAMI, FLA. Dade Co., Court House, Miami, Fla. Bids Mar. 20. CD 1/23.

Paul Smith Constr. Co., 310 N. Rome Ave., Tampa, Fla. Contract Awarded. $750,000, auto parking GARAGE, TAMPA, FLA. Tampa & Polk Streets Auto Parking Garage, c/o contractor.

† **V. L. Nicholson Co.**, 611 S. Central St., Knoxville, Tenn. Contract Awarded. $916,986, High Voltage LABORATORY Bldg. 18, Inv. No. 401-51-8A, OAK RIDGE, TENN. U. S. Atomic Energy Comn., P. O. Box E, Attention, R. J. Dunbar, Engineering Div., Oak Ridge, Tenn. Bids Feb. 8 CD 1/5.

MIDDLE WEST

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
April 19 — Michigan
April 24 — Wisconsin
STREETS AND ROADS
April 20 — Illinois
April 24 — Wisconsin

Wis., Cudahy—B.A. 4/17—City, water filtration plant, 500,000 gal. elevated storage tank. $600,000. Plans deposit $25. Consoer, Townsend & Assoc., 351 E. Ohio Ave., Chicago, Ill., engrs. CD 7/31/46.

BIDS ASKED—BUILDINGS

Ill., Marion—HOSPITAL—B.A. 4/18—Marion Memorial Hospital, John E. Giles, pres. Hospital Bd., Marion, Ill., 2 story, bsmnt. 55-bed cross-shaped 44x229 ft., HOSPITAL and 44x73 1 story wing. Approx. $900,000. Extended date. Plans deposit $25. Wm. Bitner, Inc., 408 Bd. Educ. Bldg., 911 Loust St., St. Louis, 1, Mo., archt. CD 3/2.

▲ **O., Toledo**—HIGH SCHOOL—B.A. 4/20—Bd. Educ., Washington Twp., O. K. Benton, clk., 5530 Whitmer Dr., Junior High School, Whitmer Dr. and Alexis Rd. $1,500,000. CD 11/16.

▲ **Mich., Detroit**—CITY-COUNTY BLDG.—B.A. 4/24—City, Detroit-Wayne Bldg. Comn., Mayor Cobo, chn., furnish, erect about 9,000 tons steel for 14 and 20 story, brick, steel, concrete City-County Bldg., Contr. CC-1, $17,000,000. Plans deposit $15 refundable, Harley, Ellington & Day, Inc., 153 E. Elizabeth St., Zone 1, archt. CD 1/16.

Ill., Des Plaines—HOMES—Bids Asked—Herzog & Kuntze, 1184 Walnut St., 50 homes. $500,000. A. J. Del Bianco, 5501 W. Irving Park Ave., Chicago, 54, Ill., archts.

▲ **Ind., Gary**—PLANT—Bids Asked—Wood River Refining Co., 335 W. Lewis St., Wichita, Kan., catalytic cracking plant. $7,000,000.

CONTRACTS—BUILDINGS

▲† **George A. Fuller Co.**, 597 Madison Ave., New York 22, N. Y. Contract Awarded. $30,000,000. FEED MATERIALS PRODUCTION CENTER, Near CINCINNATI, O. Atomic Energy Comn., 70 Columbus Ave., New York 23, N. Y., Catalytic Constr. Co., 1528 Walnut St., Phila., Pa., engr. CD 4/3.

▲ **Arthur G. McKee & Co.**, 2300 Chester St., Cleveland, O. Contract Awarded. $15,000,000. mfg. UNIT, pile driving, EAST CHICAGO, IND. Inland Steel Co., 38 S. Dearborn St., Chicago 3, Ill. Frank Carroll, 38 S. Dearborn St., Chicago 3, Ill., engr. Awarded Mar. 14.

▲ **Harvey A. Hansen**, 1851 N. Elston St., Chicago, 41, Ill. Contract Awarded. $1,185,832. Hale Grade SCHOOL, Melvina St. between 61 and 62 Sts., CHICAGO, ILL. Bd. Educ., 228 N. LaSalle St., Chicago, 1, Ill. Awarded Mar. 26. CD 3/27, under LB.

United Engineers & Constructors, 111 W. Washington St., Chicago, 2, Ill. Contract Awarded. $1,000,000. electric GENERATING BLDG., HAWTHORNE STA. (CICERO), ILL. Western Electric Co., 22 and Cicero Ave., Chicago, 2, Ill. Awarded Mar. 23.

▲ **Siegfried Constr. Co.**, 6 N. Pearl St., Buffalo, N. Y. Contract Awarded, $1,500,000. 175,000 sq. ft., brick steel, concrete, brick FACTORY, KANKAKEE, ILL. National Battery Co., Depew, N. Y. Awarded Mar. 23.

▲ **Austin Co.**, 510 N. Dearborn St., Chicago, 10, Ill., Contract Awarded. $3,000,000. design and construct FACTORY, BEDFORD PARK, ILL. Mid-States Gummed Paper Co., 2538 S. Daven Ave., Chicago, Ill. Awarded Jan. 26. (Correction—contractors address). CD 2/7, under CA.

▲ **Darin & Armstrong, Inc.**, 2041 Fenkel St., Detroit, Mich. Contract Awarded. $2,500,000. 1 story, 250x800 ft., brick, concrete, steel PRESS SHOP, PONTIAC, MICH. Pontiac Motors div. General Motors Corp., Pontiac, Mich. Bids Feb. 26. CD 2/20.

O. Jorgenson & Son, 1120 First St., La Salle, Ill. Contract Awarded. $640,000. Lincoln and Logan SCHOOL addns., and Douglas SCHOOL, PRINCETON, ILL. Princeton Bd. Educ., Princeton, Ill. Perkins & Wills, 309 Jackson St., Chicago 6, Ill., archts. Awarded Mar. 23.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
April 17 — Iowa
April 20 — Kansas
STREETS AND ROADS
April 17 — Iowa
April 19 — Michigan
April 20 — Kansas

Missouri—RURAL DISTRIBUTION LINES—B.A. 4/20—Intercounty Electric Co-operative, Licking, 388 mi. rural distr. lines, 21 mi. changes, Dent, Phelps, Shannon and Texas Counties. $500,000. Frank Horton & Co., Lamar, engrs. CD 2/27.

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BIDS ASKED—BUILDINGS

▲ **Tex., Wichita Falls**—DWELLINGS—B.A. 4/19—Wichita Falls Housing Auth., F. D. Jackson, Dr., Wichita Falls, 118 dwelling units in 31, one and two story bldgs., administration bldg. and site imprvs., Tex. 22-2. Approx. $1,000,000. Plans deposit $50. Boese & Harkrider, 308 Texas & Pacific Bldg., Fort Worth, archts. CD 3/30.

▲† **N. M., Los Alamos**—LABORATORY—B.A. 4/24—U. S. Atomic Energy Comn., Los Alamos, medical research laboratory. $1,500,000-$1,800,000. Plans deposit $50. CD 3/6.

▲ **Tex., Freeport**—PLANTS—Bids Asked—Dow Chemical Co., Freeport, butadiene or styrene plant, $3,000,000; ethylene chloride plant, $2,750,000; perchlor ethylene plant, $3,275,000. Engineer, c/o Dr. A. P. Beutel, c/o owner, engr. CD 6/15.

Tex., Wichita Falls—HOUSING—Bids Asked—Wichita Falls Housing Auth., Wichita Falls, 118 dwelling units for total 31 one and two story bldgs., concrete slab fdn. on fill, brick, haydite tile walls, utilities. $944,000. Plans deposit $50. Boese & Harkrider, Texas and Pacific Bldg., Fort Worth, Tex., engrs. and archts. CD 10/18/49.

SOON LETS CONTRACT—BUILDINGS

Minn., Hibbing—HOUSING—Greenhaven, Inc., Bd. Directors, R. T. Sprague, pres., Hibbing, soon lets contract, 200 residential units, incl. plumbing, heating, utilities, sewers, water, etc. $500,000. Jyring & Jurenes, Hibbing, archts.

▲ **Tex., Randolph Field (San Antonio)**—HOUSING—Murchison Bros., 1315 Pacific St., Dallas, Tex. (sponsors), soon lets contract, 600 housing units at Randolph Field. $5,000,000. Walter Ahlschlager, 212 S. St. Paul St., Dallas, archt. R. Marvin Shipman, 146 W. Olmos Dr., engr. CD 11/24/50.

LOW BIDDERS—HEAVY CONSTRUCTION

▲† **Moloney Electric Co.**, 5390 Bircher St., St. Louis, Mo., Low Bidder, **$248,682**, Schedule A***Westinghouse Electric Corp., 117 N. 13 St., Omaha, Neb. $1,079,853, Schedule B***General Electric Corp., River Rd., Schenectady, N. Y., $1,195,272, Schedule C, $2,561,421, Schedule D, for furnishing power transformers for Garridson N. D., Reservoir, Fort Randall, S. D., reservoir and Oahe, S. D., reservoir, SOUTH DAKOTA and NORTH DAKOTA, U. S. Eng., 1709 Jackson St., Omaha, Neb. Bids Mar. 21.

▲† **Westinghouse Electric Corp.**, 117 N. 13 St., Omaha, Neb., Low Bidder **$186,800**, Schedule A***General Electric Corp., River Rd., Schenectady, N. Y., $722,-350, Schedule B, $923,330, Schedule C, circuit breakers for Fort Randall and Oahe Reservoirs, SOUTH DAKOTA, U. S. Eng., 1709 Jackson St., Omaha, Neb. Bids Mar. 22. CD 2/8.

▲ **Neuces County Navigation Dist. 1**, Guggenheim-Cohn Bldg., Corpus Christi, Tex., rejected bids Mar. 29, over 2,000,000 bu. capacity rein.-con. type GRAIN ELEVATOR (headhouse over 200 ft. high), CORPUS CHRISTI, TEX. L. B. **$1,878,000**. CD 4/4, under LB.

▲† **United Engineers**, Ogden, Utah, **G. L. Tarlton Co.**, 5505 Dale St., St. Louis, Mo., and **Adler Constr. Co.**, Loveland, Colo. Low Bidder, **$2,672,440** diversion dam, siphon, four tunnels and an open canal, North Poudre Unit, of Colorado-Big Thompson Proj., Spec. DC3331, COLORADO. Bureau Reclamation, Dpt. Interior, Fort Collins, Colo. Bids Mar. 28. CD 2/26.

▲ **M. M. Paul & Sons**, 1000 E. Manuel Ave., Albuquerque, N. M., Low Bidder, **$458,461**, grading, minor drainage structure, one multiple concrete box culvert 63.525 ft. long, hot plant, bit. surf. course, misc. constr. 10.54 mi. N. M. Hy. Routes 47 and 361. FAP Nos. S-94 (1) and S-191 (1), Bernalillo Co.*** **Brown Contg. Co.**, 3525 N. 4 St., Albuquerque, N. M., **$556,976**, grading, minor drainage structure, one multiple concrete box culvert over 20 ft. clear span, one concrete, steel bridge 144.34 ft. long, hot plant asph. surf. course and misc. constr. 8.654 mi. U. S. Hy. Route 66, between Newkirk and Montoya, FAP No. FI-114 (7), Guadalupe Co.***Lowdermilk Bros., Los Alamos, N. M., **$285,124**, grading, minor drainage structure, one multiple concrete box culvert over 20 ft. clear span, one concrete, steel bridge 208.34 ft. long, hot plant asph. surf. 3.563 mi. U. S. Hy. Route No. 66 between Newkirk and Montoya, FAP No. FI-114 (8), Quay Co., NEW MEXICO. State Hy. Dpt., Capitol Bldg., Santa Fe, N. M. Bids Mar. 23. CD 3/14.

▲† **R. E. McKee General Contractor, Inc.**, Box 1706, Santa Fe, N. M. Low Bidder **$1,123,200**, est. $1,000,-000. rein.-con. type BUILDINGS and facilities, Group 131, Area-TA-16 Proj. J. Inv. No. 291-51-78, LOS ALAMOS, N. M. U. S. Atomic Energy Comn., Los Alamos, N. M. Bids Mar. 28. CD 2/21.

CONTRACTS—HEAVY CONSTRUCTION

City, Minneapolis, Minn. Own Forces. **$900,000**. 16 m.g. concrete reservoir at Fridley, MINNEAPOLIS, MINN. CD 2/3/47.

▲ **Gulf Southern Contractors**, Fort Worth, Tex. Contract Awarded **$25,000,000**. 1,000 mi. natural gas pipe line, TEXAS-LOUISIANA-MISSISSIPPI. United Gas Pipe Line Co., 1525 Fairfield St., Shreveport, La. CD 7/31.

† **McKenzie Constr. Co.**, Transit Tower, San Antonio, Tex. Contract Awarded, **$585,000**, est. $600,000, parking apron, Inv. No. Eng. 41-243-51-43, RANDOLPH FIELD, near San Antonio, TEX. U. S. Eng., 606 Santa Fe Bldg., Galveston, Tex. Bids Mar. 22. CD 3/27, under LB.

† **Trans-Electric Co.**, 108 E. Oak St., Louisville, Ky., Contract Awarded, **$921,499**, constr. 59 mi. Salida-Gunnison 115-kv transmission line, Colorado-Big Thompson Proj., Spec. DC-3314, COLORADO Bureau

Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Colo. Bids Mar. 8, awarded Mar. 27. CD 3/22, under LB.

Geins & Hon Constr. Co., P. O. Box 189, Horton, Kan. Contract Awarded, $567,451. 520.77 mi. rural distr. lines and sys. imprvs., Kit Carson Co. COLORADO. K. C. Electric Assoc., Hugo, Colo., C-B. Eng. Co., 25 S. Grove St., Denver, 4, Colo., engr. CD 11/15.

CONTRACTS—BUILDINGS

Winn-Senter Constr. Co., Railway Exchange Bldg., Kansas City 6, Mo. Contract Awarded. $750,000. 60 ton capacity dry felt MILL, KANSAS CITY, MO. American Asphalt Roof Corp., 7600 Truman Rd., Kansas City 3, Mo. George McIntyre, Dwight Bldg., Kansas City 6, Mo., archt.

H. B. Deal & Co., Inc., 5517 Machester Ave., St. Louis 10, Mo. Contract Awarded. $625,000. 2 story, 45x 180 ft., brick, stone, rein.-con. Cancer RESEARCH INSTITUTE, Grand Blvd. and Vista Ave., ST. LOUIS, MO. St. Louis University, 221 N. Grand Blvd., St. Louis, Mo. Bids Mar. 13. CD 3/15.

Black, Sivalls & Bryson, Inc., 2131 Westwood St., Oklahoma City, Okla. Own Forces. $500,000. enlarging SHOP by 108,000 sq. ft., OKLAHOMA CITY, OKLA. K. B. Banks, 2121 Westwood St., Oklahoma City 8, Okla., engr.

W. R. Grimshaw, K.O.M.E. Bldg., Tulsa, Okla. Contract Awarded, $767,000. EDUCATIONAL BLDG. TULSA, OKLA. First Baptist Church, 4 and Cincinnati Sts., Tulsa, Okla., Bids Dec. 12, awarded Jan. 18. CD 1/9, under LB.

▲† **Walden, Fulton & Payne**, 114 North College Ave., Lubbock, Tex. Contract Awarded. $1,408,005. ADMINISTRATION BLDG. 36; Transportation Bldg. 35, new ramps and modifications to existing ramps, Pantex Ordnance Plant, Inv. No. 291-51-80, AMARILLO, TEX. U. S. Atomic Energy Comn., Box 1086, Amarillo, Tex. Bids Mar. 19, awarded Mar. 27. CD 3/5.

T. D. Howe, Box 7528, Houston, Tex. Contract Awarded. $592,786. Booker T. Washington SCHOOL, CONROE, TEX. Conroe Independent School Dist., Conroe, Tex. Bids Mar. 22, awarded Mar. 29. CD 4/2, under LB.

▲ **Foster Wheeler Corp.**, Shell Bldg., Houston, Tex. Contract Awarded. Approx. $3,750,000. CAUSTIC PLANT, FREEPORT, TEX. Dow Chemical Co., Freeport, Tex. Dr. A. P. Beutel, c/o owner, engr. CD 6/15.

▲ **Henry C. Beck Co.**, Irwin Keasler Bldg., Dallas, Tex. and **H. R. Henderson & Co.**, Marshall, Tex. Contract Awarded. Approx. $80,000,000. aluminum PLANT, GREGORY, TEX. Reynolds Metals Co., Hunt Bldg., Gregory, Tex. J. Gordon Turnbull, 2630 Chester St., Cleveland, O., project engr. CD 2/20.

FAR WEST

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS

BRIDGES
April 26
California

STREETS AND ROADS
April 25
California

April 26
California

LOW BIDDERS—HEAVY CONSTRUCTION

† **Morrison-Knudsen Co., Inc.**, 411 W. 5 St., Los Angeles, Calif., Low Bidder, $973,946, est. $811,122, earthwork, canal lining and structures for Wellton Canal, Station 1 plus 00.29 to 618 plus 25.75 Gila Proj., Spec. DC-3333, ARIZONA. Bureau Reclamation Dpt. Interior, Federal Bldg., Yuma, Ariz. Bids Mar. 27. CD 3/7.

▲† **J. A. Terteling & Sons**, 4011 Fairview Ave., Boise, Idaho, Low Bidder Schedule (1), $2,888,492, est. $3,976,905; **Marshall, Haas Royce**, Belmont, Calif. Schedule (2), $596,236, est. $650,015, earthwork and structures for Schedule 1, East Low Canal Station 2090 plus 75 to 2216 plus 00 and 2899 plus 00 to 2980 plus 00 and Lind Coulee Water way (2) East Low Canal 2216+ plus 00 to 2899 plus 00, Columbia Basin Proj., Spec. DC. 3315, WASHINGTON Bureau Reclamation, Dpt. Interior. Bldg. 1-A, Denver Federal Center, Denver, Colo. Bids Mar. 22. CD 2/13.

† **United Concrete Pipe Corp.**, Box 425, Baldwin Park, Calif., Low Bidder, $743,966, rein.-con. pipe for Unit 3, Southern San Joaquin Municipal District Friant-Kern Canal, Distribution System, Central Valley Proj., Spec. DC-3328, CALIFORNIA. Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Colo. Bids Mar. 27. CD 2/26.

▲† **United Concrete Pipe Corp.**, Box 425, Baldwin Park, Calif. Low Bidder. $1,671,177, earthwork pipe lines, etc., Unit 3 South San Joaquin Municipal Utility Dist., Central Valley Proj., near Delano, Spec. DC-3327, CALIFORNIA. Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Colo. Bids Mar. 27. CD 2/26.

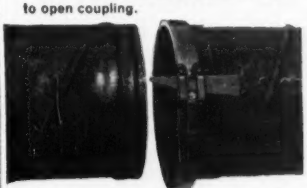
▲ † **Peter Kiewit Sons Co.**, 345 Kieways Ave., Arcadia, Calif. Low Bidder. $2,219,922. Imprv. Los Angeles River Channel, Imperial Hy. to Pacific Electric Railway Bridge, Hollydale, CIVENG 04-353-51-20, CALIFORNIA. U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif. Bids Mar. 15. CD 2/5.

▲† **Peter Kiewit Sons Co.**, 345 Kieways Avenue, Arcadia, Calif. Low Bidder. $1,357,778, Rio Hondo Channel Imprvt., Downey, CIVENG 04-353-51-23, CALIFORNIA. U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif. Bids Mar. 27. CD 2/21.

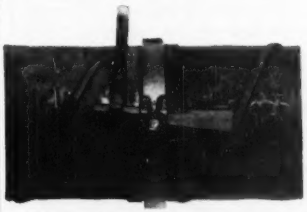
LOW BIDDERS—BUILDINGS

Johnson & Vedder, 3419 Hyde Park Blvd., Los Angeles, Calif., Low Bidder. $544,499, est. $335,000, 1 story steel, rein.-con. LOCUST SCHOOL, COMPTON,

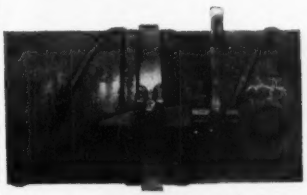
1 Drive wedge into the two parallel lugs to open coupling.



2 Slip coupling over pipe end and put next joint of pipe in place.



3 Drive out opening wedge so coupling snaps into place on grooved ends of pipe.



4 Drive wedge home into the three lugs on coupling.

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with a hammer...

when you use

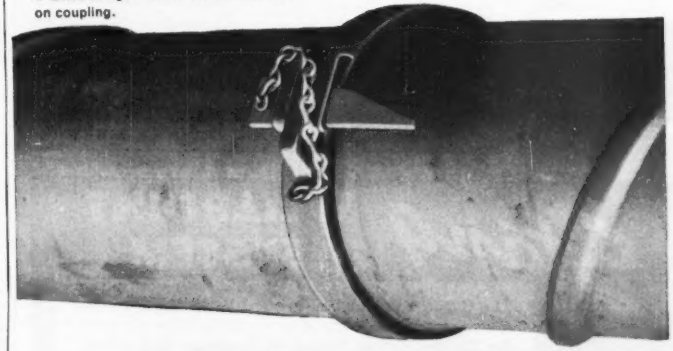
NAYLOR WEDGE-LOCK COUPLINGS

One, two, three, four—and the connection is made in seconds, not minutes. And a hammer is the only tool you need.

That's how simple it is to connect Naylor Pipe with Naylor Wedge-Lock Couplings. Built in one piece with gasket already in place, this Naylor Coupling provides a tight, leakfree joint faster than ever before possible.

Since the coupling takes up little more room than the pipe itself, it permits the line to hug the wall in tunnels or wherever space is limited. Lines can be made up with only one side of the pipe in the open.

For the full story on this practical Naylor combination, write for Bulletin No. 507.



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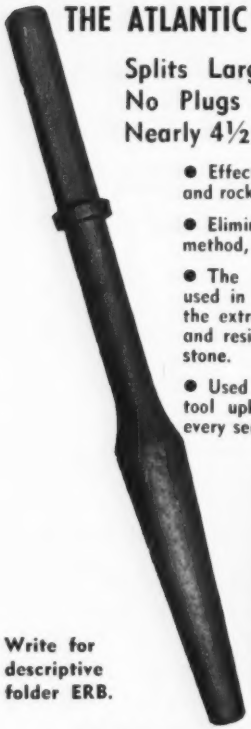

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CALIF. Compton City School Dist., 604 S. Timarind St., Compton, Calif. Bids Mar. 26 CD 2/21.

H. J. Farrington, 9207 S. Lakewood St., Rivera, Calif., Low Bidder. $520,000, frame, stucco Ocean View Elementary School, WHITTIER, CALIF. East Whittier Elementary School Dist., 14471 E. Whittier Blvd., Whittier, Calif. Bids Mar. 26 CD 3/15.

CONTRACTS—HEAVY CONSTRUCTION

▲† General Constr. Co., 3840 Iowa St., Seattle, Wash. Contract Awarded. $1,515,700. major reconstruction of Pier 91 involving 112,000 lin. ft. new piling, Specs. 26593, SEATTLE, WASH. P. Wks. Officer, 13th Naval Dist., 1611 W. Wheeler St., Seattle, Wash. CD 3/13, under L.B.

▲ Stone & Webster Eng. Corp., 49 Federal St., Boston, Mass. Contract Awarded, $11,000,000, design and construct raising Rock Island Dam and expanding power plant on Columbia River, near WENATCHEE, WASH. Chelan Co. Public Utility Dist., Wenatchee, Wash. CD 1/2.

Cox Bros. Constr. Co., P.O. Box 36, Stanton, Calif. Contract Awarded. $967,355, grading, paving, portions highway, construct 3 rein.-con. box girder grade separations in Oceanside, San Diego, Co., CALIFORNIA. State Div. Hys., 120 S. Spring St., Los Angeles, Calif. Bids Mar. 15. Awarded Mar. 28. CD 3/21, under LB.

CONTRACTS—BUILDINGS

▲ Del E. Webb Constr. Co., S 23 Ave., Phoenix, Ariz., Contract Awarded, $6,000,000-$9,000,000, guided missilles PLANT, TUCSON, ARIZ. Hughes Aircraft Co., Div. of Hughes Tool Co., Florence and Teale Sts., Culver City, Calif. CD 3/23, under Ariz., Phoenix.

▲ Brentwood Builders, 1150 S. Beverly Dr., Los Angeles, Calif. Owner Builds. Est. $3,400,000. 400 frame, stucco DWELLINGS at Whiteoak and Stagg Sts., LOS ANGELES, CALIF. E. H. Fickett, 5657 Wishire Blvd., Los Angeles, Calif., archt. CD 7/25/50.

Van Owen Square 6338 Wilshire Blvd., Los Angeles, Calif. Owner Builds. $552,200, 66 stucco DWELLINGS in Tract 16335, LOS ANGELES, CALIF. Southwest Drafting Service, 2727 W. Florence St., Los Angeles, Calif. archts.

Albert Reingardt, 3825 E. 7 St., Long Beach, Calif., Contract Awarded. $642,522. Elmcroft and Grayland SCHOOLS, NORWALK, CALIF. Norwalk School Dist., 12110 E. Walnut St., Norwalk, Calif. Bids Dec. 12. CD 12/1.

Waale-Camplan Co., 4860 Valley Blvd., Los Angeles, Calif. Contract Awarded. $613,213. primary SCHOOL, Bloomfield St., NORWALK, CALIF. Norwalk School Dist., 12110 E. Walnut St., Norwalk, Calif. Kistner, Curtis & Wright, 816 W. 5 St., Los Angeles, Calif., archts.

▲ M. J. Brock & Sons, Inc., 2894 Rowena Ave., Los Angeles, Calif., Contract Awarded. $1,215,000. Floral Drive SCHOOL, WHITTIER, CALIF. Wifttier City School Dist., 215 W. Hadley St., Whittier, Calif. Bids Mar. 14, awarded Mar. 23. CD 3/21, under LB.

ALASKA

BIDS ASKED—HEAVY CONSTRUCTION

† Alaska—GYMNASIUM—B.A. 4/24—U. S. Eng., (APO 942, c/o PM, Seattle, Wash.) Anchorage, gymnasium and indoor training facility at Ladd Air Force Base land at Eielson Air Force Base, Inv. No. S95-507-51-76. Plans deposit $50. CD 3/14.

BIDS ASKED—BUILDINGS

† Alaska, Fort Richardson—INDOOR TRAINING FACILITY BLDG.—B.A. 4/24—U. S. Eng., New Washington Hotel, Seattle, Wash., indoor training facility bldg., Inv. No. S95-507-51-80. Plans deposit $100. Extended date. CD 3/20.

Alaska, Fort Richardson—REFRIGERATED WAREHOUSE—B.A. 4/24—U. S. Eng., New Washington Hotel, Seattle, Wash., refrigerated warehouse bldg., Inv. No. S95-507-51-77. Plans deposit $50. CD 3/7.

CONTRACTS—HEAVY CONSTRUCTION

▲† J. C. Boespflug Constr. Co. and S. Birch & Sons, 1912 4 Ave. S., Seattle, Wash. Contract Awarded $3,491,575; est. $3,825,069, 19 bachelor officers

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quarters, male and four B. O. Q.s female, Inv. No. 51-42, Elmendorf Air Force Base, ALASKA, U. S. Eng. (APO 942, c/o PM, Seattle, Wash.) Anchorage, Alaska. Bids Mar. 7. CD 3/13, under LB.

▲† **J. C. Boespflug Constr. Co.** and **S. Birch & Sons**, 1912 4 Ave. S., Seattle, Wash. Contract Awarded. $1,369,939, est. $1,418,240. 7 bachelor officers' quarters, male, Inv. 51-62, Ladd Air Force Base, ALASKA. U. E. Eng., (APO 942, c/o PM, Seattle, Wash.) Anchorage, Alaska. Bids Mar. 7. CD 3/14 under LB.

CANADA

BIDS ASKED—HEAVY CONSTRUCTION

N. B., Chatham—QUARTERS, etc.—B.A. 4/17—P. J. Mangan, engr. Defence Constr. Ltd., 1032 Gottingen St., Halifax, N. S. two officers, quarters, officers' mess (less structural steel) Guard House, N. C. O. Quarters, and construction Engineering Bldg. at R. C. A. F. Station. Approx. $950,000. Plans deposit $100.

BIDS ASKED—BUILDINGS

▲ **Ont., North Bay**—BUILDINGS—B. A. 4/17—S. M. Connolly, engr. Defence Constr, Ltd., 441 Queen's Quay, Toronto, Ont. one FHF/DF Building; one Cannon Stop butt; one 25 yard range; one ration depot; one engineers bldg.; one guard house; one officers mess; two officers quarters; two N.C.O. quarters; one O.R. quarters, at R.C.A.F. Station, near here. Approx. $1,000,000. Plans deposit $100.

Ont., Barrie—SCHOOL—B.A. 4/19—Barrie District Collegiate Institute Bd., 178 Bayfield St., 2 story brick school addn. $570,000. Plans deposit $50. Page & Steele, 72 St. Clair Ave. W., Toronto, archts. CD 10/31.

▲ **Alta., Edmonton**—HOSPITAL—Bids Asked—Edmonton General Hospital, Edmonton, superstructure, 200-bed, 45x1250 ft., rein.-con. brick hospital, $1,500,000. G. H. MacDonald, Tegler Bldg., archt.

SOON LETS CONTRACTS—BUILDINGS

▲ **Que., Quebec City**—HOUSES—Syndicate Cooperatif des Habitatious Ouvrieres de Quebec, 79 Notre Dame St., soon lets contract, 250 houses on grounds of general hospital, $1,500,000. G. Amyot, 2 Belvedere Ave., archt.

LOW BIDDERS—BUILDINGS

▲ **W. H. Yates Constr. Co. Ltd.**, 400 Wellington St. W. Hamilton, Ont. Low Bidder. Approx. $2,211,966, 5 and part 4 story, 42x419 ft., Y-shaped, concrete brick, tile, Henderson HOSPITAL, HAMILTON, ONT. City, L. D. Jackons, mayor, City Hall, Hamilton, Ont. Bids Mar. 9. CD 2/15.

CONTRACTS—HEAVY CONSTRUCTION

▲ **Morrison-Knudsen of Canada, Ltd.**, 1304 Hornby St., Vancouver, B. C., Contract Awarded, 11 mi. access road from Kemano Bay, to site of proposed $500,000,000 power plant of company's on Kemano River, KITIMAT, B. C. Aluminum Co. of Canada Ltd., Sun Life Bldg., Montreal, Que. (Correction—contractor). CD 2/27, under CA.

▲ **Gilpin-Nash Ltd.**, 2265 W. 41 Ave., Vancouver, B. C., Contract Awarded. $5,769,216, general contract concrete gravity type and 640 ft. long at crest and 325 ft. high dam for WW supply straight spillway section is specified; Evans, Coleman & Evans, Ltd., North foot of Columbia St., Vancouver, B. C., $746,014, supply portland cement for required work for new Capilano Water Supply dam on Capilano River, North Vancouver, VANCOUVER, B. C. Greater Vancouver Water Dist., 500 Beatty St., Vancouver, B. C. Bids Mar. 8, awarded Mar. 29. CD 3/14, under LB.

▲ **British Columbia Bridge & Dredging Co. Ltd.**, 544 Howe St., Vancouver, B. C., **Dawson, Wade & Co. Ltd.**, 775 Clark Dr., Vancouver, B. C., Contract Awarded. $6,254,376 central portion Granville Street Bridge structural steel with piers and deck of rein.-con. and foundations containing steel and wood pilling, VANCOUVER, B. C. City, City Hall, Vancouver, B. C. Bids Mar. 19, awarded Mar. 28. CD 3/27, under LB.

▲ **Atlas Constr. Co., Ltd.**, 4781 St. Catherine St. W., Westmount, (Montreal), Que. Contract Awarded. Approx. $1,403,322. Collector sewer in west end of city in Nepean area to drain new western sections of city into regular city sewage outlet, OTTAWA, ONT. City, Ottawa, Ont. Bids Mar. 27. CD 3/9.

CONTRACTS—BUILDINGS

Milne & Nicholls Ltd., 57 Bloor St. W., Toronto, Ont. Contract Awarded. Approx. $850,000. HIGH SCHOOL addn., TORONTO, ONT. Etobicoke Bd. Educ., Cordova Rd., Islington, Ont. Bids Mar. 8, awarded Mar. 26. CD 2/20.

Anglin-Norcross Quebec Ltd., 892 Sherbrooke St. W., Montreal, Que. Contract Awarded. Approx. $625,000. PLANT and OFFICES on Cote de Liesse Rd., MONTREAL, QUE. Salada Tea Co. of Canada Ltd., 641 King St. W., Toronto, Ont. CD 1/15/46.

AMERICANS ABROAD

CONTRACTS—HEAVY CONSTRUCTION

▲ **Merritt-Chapman & Scott Corp.**, 17 Battery Pl., New York 4, N. Y., **Raymond Concrete Pile Co.**, 140 Cedar St., New York, N. Y., and **Fletcher Constr. Co. Ltd.**, Auckland, New Zealand. Contract Awarded. Approx. $3,137,409, rein.-con. substructure and deck of 1,200 ft. x 300 ft. pier, to be known as Import Wharf, incl. rail facilities and inshore steel pile retaining bulkhead, AUCKLAND, NEW ZEALAND. Auckland Harbour Board, Auckland, New Zealand.

SEARCHLIGHT SECTION

This index is published as a convenience to the readers. Every care is taken to make it accurate, but Searchlight Section assumes no responsibility for errors or omissions.

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OFFICIAL PROPOSALS

appear here each Thursday. Proposal advertisements accepted up to 10:00 p.m. Thursday for the issue dated the following Thursday.

Bids: April 24, 1951

Route Dualization

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Commissioner for:

ROUTE 3, SECTION 1-C

Dualization on Route 3, Section 1-C, from Route 1 to Paterson Plank Road, North Bergen Township and Town of Secaucus, Hudson County. Length 0.627 mile.

Estimated:

19,300 cu. yds. Roadway Excavation—Earth
6,200 sq. yds. 4"&5" Waterbound Macadam Base
6,200 sq. yds. 3" Waterbound Mac. Inter. Course
900 tons Bit. Concrete, Type MA-BC
8,400 sq. yds. 10" Rein. Conc. Pavement Surface

Bids for the above will be received at the office of the State Highway Department, Assembly Room, Room 140, in the State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey, on Tuesday, April 24, 1951, at eleven o'clock (11:00 A.M.—EASTERN STANDARD TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant and equipment with their bid.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, N. J., and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Avenue, Trenton, N. J. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: R. J. Abbott
State Highway Commissioner

Office of the District Engineer, Corps of Engineers, U. S. Army 1217 U. S. Post Office and Custom House, St. Paul 1, Minnesota. —Sealed bids, in duplicate, for furnishing all labor and materials and performing all work required for Construction of Access Road and Improvement of Earth Dam at Marsh Lake Dam, Minnesota River, near Appleton, Minnesota, will be received in this office until 2:00 P.M., C.S.T., April 24, 1951, and then publicly opened. Further information upon application.

(Continued on page 110)

U. S. Government

(Continued from page 109)

BIDS FOR REPLATING STEEL BARGES—Memphis District, Corps of Engineers, U. S. Army, P. O. Box 57, Memphis 1, Tenn. Sealed bids will be received until 11:00 a.m., C.S.T., 17 April 1951, and then publicly opened for replating twenty steel material barges. Information upon request.

Office of the District Engineer, Corps of Engineers, U. S. Army 1217 U. S. Post Office and Custom House, St. Paul 1, Minnesota.—Sealed bids, in duplicate, for furnishing all labor and materials and performing all work required for Reservoir Clearing, Stage No. 3, Lake Ashtabula (Baldhill Reservoir) Sheyenne River, North Dakota, will be received in this office until 2:00 P.M., C.S.T., April 18, 1951, and then publicly opened. Further information upon application.

Office of the District Engineer, Corps of Engineers, U. S. Army 1217 U. S. Post Office and Custom House, St. Paul 1, Minnesota.—Sealed bids, in duplicate, for furnishing all labor and materials and performing all work required for Road Raise and Modification of Outlet Structure, Lower Red Lake, Minnesota, will be received in this office until 2:00 P.M., C.S.T., April 17, 1951, and then publicly opened. Further information upon application.

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-375) will be received by Bureau of Reclamation, Yuma, Arizona, until April 27, 1951, and then publicly opened for furnishing labor and materials and performing all work for the construction of earthwork, canal lining, and structures for Mohawk Canal, Station 1547+91 to Station 2056+74, and Tyson protective dike and outlet channel, Wellton-Mohawk Division, Gila Project, Arizona. The work is situated approximately 20 miles northeast of Wellton, Arizona. Principal items are approximately: 2,990,000 cu. yds. excavation; 17,000 cu. yds., concrete; 1,200 lin. ft. of 96-inch concrete pipe; 41,00 cu. yds., riprap; 50,000 lbs., metalwork; and other work. Time allowed for completion will be 200 or 280 days. For particulars, address Bureau of Reclamation, Yuma, Arizona; or Building 1-A, Denver Federal Center, Denver, Colorado.

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-3372) will be received by Bureau of Reclamation, Hot Springs, South Dakota, until May 3, 1951, and then publicly opened for furnishing labor and materials and performing all work for the construction of earthwork, canal lining, and structures for Angostura Canal, Station 164+89 to Station 1611+50, laterals, sublaterals, and surface drains, Angostura Unit, Cheyenne Division, South Dakota, Missouri River Basin Project. The work is situated near Hot Springs, South Dakota. Principal items in 6 schedules are approximately: 2,417,000 cu. yds. excavation; 5,900 cu. yds., concrete; 300 M.fm., furnishing and erecting timber; 68,500 pounds, furnishing and installing metalwork; 22,100 lin. ft., furnishing and laying concrete pipe; 4 radial gates, furnishing and installing; and other work. Time allowed for completion will be 690 days. For particulars, address Bureau of Reclamation, Hot Springs, South Dakota; or Building 1-A, Denver Federal Center, Denver, Colorado.

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-3371) will be received by Bureau of Reclamation, Grand Junction, Colorado, until April 26, 1951, and then publicly opened for furnishing labor and materials and performing all work for the construction of 3 siphons and a check for Highline Canal, Grand Valley Project, Colorado. The work is situated in the vicinity of Grand Junction, Colorado. Principal items in 2 schedules are approximately: 15,800 cu. yds., excavation; 110 cu. yds., concrete; 5,800 lin. ft., precast-concrete pipe, 18- to 60-in. diameter; 4,000 lbs., metalwork; and other work. Time allowed for completion will be 290 days. For particulars, address Bureau of Reclamation, Grand Junction, Colorado; or Building 1-A, Denver Federal Center, Denver, Colorado.

U. S. Government

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-3369) will be received by Bureau of Reclamation, Yuma, Arizona, until May 1, 1951, and then publicly opened for furnishing labor and materials and performing all work for the construction of earthwork and structures, Yuma Levee, Lower Colorado River District, Colorado River Front Work and Levee System, Arizona-California-Nevada. The work is situated near Yuma, Arizona. Principal items are approximately: embankment, 765,000 cu. yds.; riprap, 190,000 cu. yds.; hauling riprap, 4,000,000 cu. yd. miles; and other work. The work is divided into 2 schedules. Time allowed for completion will be 450 days. For particulars, address Bureau of Reclamation, Yuma, Arizona; or Building 1-A, Denver Federal Center, Denver, Colorado.

OFFICIAL PROPOSALS

Bids: May 1, 1951

THE HYDRO-ELECTRIC POWER COMMISSION OF ONTARIO

SIR ADAM BECK-NIAGARA GENERATING STATION NO. 2
TENDERS FOR CONSTRUCTION OF HYDRAULIC TUNNEL

Sealed tenders, in duplicate, addressed to the undersigned and clearly marked "Tender for Hydraulic Tunnel, Section No. ——, Sir Adam Beck-Niagara Generating Station No. 2" will be received up to 4 p. m. Eastern Standard Time.

Tuesday, May 1st, 1951

for the construction of any or all of the four Sections of Hydraulic Tunnel, each approximately 6,225 feet in length, of circular cross-section, concrete-lined, with 45 feet finished diameter. The principal features of the work to be performed in each Section comprise:—one work shaft, excavation of tunnel, installation of structural steel support, construction of concrete lining reinforced where required, grouting of rock and behind concrete lining wherever necessary, and cementering of the work.

Copies of Form of Agreement, Information for and Instructions to Tenderers, General Conditions and Specification, Plans, Form of Tender and Labour Agreement may be obtained on or after March 30th, 1951 from the Director of Supply, 620 University Avenue, Toronto, Ontario, upon payment of a deposit in the amount of $1,000.00 per set, which amount will be refunded upon submission of a tender accompanied by the required security. If no such tender is submitted but the documents are returned in good order $750.00 of the said deposit will be returned. Failing return of the documents in good order the Commission will retain the full amount of the deposit.

Each tender for each Section of the Hydraulic Tunnel must be accompanied by a certified cheque on a Canadian Chartered Bank for the sum of Five Hundred Thousand Dollars ($500,000.00) payable to the order of the Commission. The Tenderer to whom a contract is awarded shall be required to provide a performance bond satisfactory to the Commission for fifty per cent (50%) of its tender price. Each certified cheque, furnished by each Tenderer, will be retained by the Commission until the contract for the Section to which it applies has been executed and the required performance bond has been furnished. As soon as possible thereafter, the certified cheques of the unsuccessful tenderers will be returned. If a Tenderer after being awarded a contract for a Section, refuses to execute the contract or fails to furnish the required performance bond, Two Hundred and Fifty Thousand Dollars ($250,000.00) of the proceeds of the certified cheque of such Tenderer shall be forfeited to the Commission as ascertained and liquidated damages and the balance returned. If a successful tenderer fulfills the obligations as to executing a contract and furnishing a performance bond, its certified cheque will be returned.

The lowest or any tender will not necessarily be accepted.

Robert H. Saunders, C.B.E., K.C.,
Chairman, and Members of The
Hydro-Electric Power Commission of Ontario,
620 University Avenue,
TORONTO 2, Ontario.

OFFICIAL PROPOSALS

Bids: May 2, 1951

Connections to Henry Hudson Parkway
Stage 1—Foundations

THE PORT OF NEW YORK AUTHORITY
CONTRACT GWB-130.001

Sealed proposals for the construction of foundations for connections to the Henry Hudson Parkway, Stage 1, at the Manhattan approaches of the George Washington Bridge will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 8th Ave., New York 11, until 2:00 P.M., Wednesday, May 2, 1951, and thereafter in the Auditorium of the Authority at the same address until 2:30 P.M., on the same date, at which latter time and place said proposals will be publicly opened and read.

Contract documents may be seen at the office of the Chief Engineer and copies will be furnished upon deposit of $25 per set. The deposit will be remitted if the documents are returned in good condition, not later than 30 days after the opening of proposals.

THE PORT OF NEW YORK
AUTHORITY
Howard S. Cullman, Chairman

New York, April 12, 1951.

Bids: May 1, 1951

Contract No. 10
Electrical Installations

THE DELAWARE MEMORIAL BRIDGE

Sealed proposals for furnishing and installing electrical equipment for "The Delaware Memorial Bridge" over the Delaware River near Wilmington, Delaware, will be received by the Delaware State Highway Department at the office of the Director, Delaware Crossing Division, Continental American Building, Wilmington, Delaware, until 12 o'clock noon, Eastern Standard Time, May 1, 1951, at which time and place said proposals will be publicly opened and read.

The entire work involves furnishing and installing equipment for the following:

(1) 4160V primary service line from a terminal pole (installed by others) near the Administration Building to and including transformer stations and permanent power and light feeder to the Administration Building.
(2) Toll Area Series Lighting.
(3) Tower Power and Lighting Systems including feed for elevators.
(4) Navigation and Range Lights.
(5) Aviation Beacons.
(6) Bridge Roadway Series Lighting.
(7) Wireways for Telephone System.
(8) Anchorage Lighting.

Work on Contract No. 10 shall begin promptly after the execution of the Contract. It shall be completed on or before December 31, 1951.

Monthly payments will be made for ninety (90) per cent of the construction completed each month.

Bidders must submit proposals upon forms provided by the Department.

Each proposal must be accompanied by an acceptable surety bond or certified check to the amount of at least ten (10) per cent of the total amount of the proposal.

The Contract will be awarded or proposals rejected within thirty (30) days from the date of opening proposals. The right is reserved to reject any or all bids.

The Plans and Specifications and other contract documents may be examined at the office of the Director, Delaware Crossing Division, and at the office of the Engineers, Howard, Needles, Tammen & Bergendoff, 55 Liberty Street, New York 5, N. Y. One complete set of the Plans and two copies of the Specifications may be obtained from the Engineers after April 6, 1951 upon payment of $15.00. Any prospective bidder who has made such a deposit may secure extra blueprint copies of the Plans upon payment of 50 cents per drawing, and extra copies of the Specifications upon payment of $2.50 per copy.

Plans and Specifications need not be returned to the Engineers, and the above payments will not be refunded.

State Highway Department
by: J. Gordon Smith, Chairman
W. A. McWilliams, Director
Delaware Crossing Division
April 3, 1951

(Continued on page 111)

OFFICIAL PROPOSALS

(Continued from page 110)

Bids: April 23, 1951

Plumbing Work—New Toll Houses

THE DELAWARE RIVER JOINT COMMISSION
CAMDEN, NEW JERSEY

Sealed bids will be received upon Contract No. 17, "Plumbing Work for new toll houses of the Delaware River Bridge" at the office of the Secretary of The Delaware River Joint Commission, Administration Building, Bridge Plaza, Camden, New Jersey until 1:30 P. M. Eastern Standard Time, Monday, April 23, 1951 and then and there will be publicly opened and read.

A more complete description of the work and full information for bidders are given in the Contract Documents and Specifications for this Contract, which may be obtained upon a deposit of Ten Dollars ($10.00) which will be remitted upon receipt of bid or the return in good condition of the copies so taken within thirty (30) days after the opening of bids.

Each proposal must be accompanied by a certified or cashiers' check, payable to The Delaware River Joint Commission in the amount of $2,500.00.

The check must be drawn upon a National or State Bank or Trust Company having an office either in Philadelphia, Pennsylvania or Camden, New Jersey and must not be enclosed with the sealed bid. The Surety's consent must be shown. The bidder to whom the contract is awarded will be required to furnish a Performance and Labor Materialmen's Bond in the sum of One Hundred percent (100%) for the Contract.

The Commission will afford prospective bidders an opportunity to inspect the site of the work.

The Commission reserves the right to waive any informalities in the bids received, to reject any or all bids; and to award the contract only to those experienced in this class of work and to the bidder whose proposal is deemed by the Commission to be most advantageous to the public interest.

THE DELAWARE RIVER JOINT COMMISSION
JOSEPH K. COSTELLO
Secretary

Bids: April 23, 1951

Sewage Disposal

DEPARTMENT OF PUBLIC WORKS,
MIDDLETOWN, NEW YORK

Sealed proposals will be received by the Board of Estimate and Apportionment of the City of Middletown, New York at the office of the Commissioner of Public Works until 2:00 P. M. on April 23, 1951, for the construction of secondary sewage treatment works at the present municipal sewage dispisal plant.

Bids will include the construction of:

2—	105' diameter stone filters
2—	105' diameter clarifiers
1—	new digester
2	new enclosed sludge drying beds and pumping station

Alterations to present facilities together with all necessary piping, fittings, and concrete structures.

Proposals will be publicly opened and read at 2:00 P. M., April 23, 1951.

Plans and specifications may be examined at the office of the Commissioner of Public Works, City Hall, Middletown, New York. A deposit of $25.00 will be required for each set of plans and specifications distributed, which amount will be refunded only to those submitting formal bids. If said plans and specifications are returned in good condition within 30 days after the bids have been received and acted upon by the Board of Estimate & Apportionment of the City of Middletown.

Proposals shall be made upon the forms provided therefor, in accordance with specifications, copies of which may be secured at the office of said Commissioner.

The Board of Estimate and Apportionment reserves the right to reject any and all bids and to accept the bid they consider to be in the best interest of the City of Middletown.

By order of
THE BOARD OF ESTIMATE & APPORTIONMENT
G. W. Chumard
COMMISSIONER OF PUBLIC WORKS

OFFICIAL PROPOSALS

Bids: April 27, 1951

Roadway Lighting

DELAWARE RIVER
JOINT TOLL BRIDGE COMMISSION
526 Broad Street Bank Building
Trenton 8, New Jersey

Sealed proposals for the installation of the Roadway Lighting for the Delaware River Bridge and Approaches between Morrisville, Pennsylvania and Trenton, New Jersey will be received by the Delaware River Joint Toll Bridge Commission at its Office, 526 Broad Street Bank Building, Trenton 8, New Jersey, until eleven o'clock (11:00) A.M., Eastern Standard Time, on the 27th day of April, 1951, at which time and place all bids will be publicly opened and read aloud.

After Monday, April 2, 1951, Instructions to Bidders, form of Proposal, form of Contract, form of Performance Bond, Plans and Specifications may be examined at the office of the Commission, above address, or at the office of the J. E. Greiner Company, 1201 St. Paul Street, Baltimore 2, Maryland, and copies thereof obtained upon payment of a $5.00 deposit for each set. This deposit will be refunded upon the return of the documents in usable condition within 30 days after receipt of bids.

The work includes furnishing and installing the roadway lighting and lighted signs for approximately 5700 feet of roadway and bridges. The following are approximate quantities of the major items:—

Luminires, ballasts, and lamps	135
Standards	120
Concrete Foundations for Light Standards and Signs	83
Brackets	125
Wire	60,000 L. F.
Transformers	3
Transite Conduit	30,000 L. F.

All checks shall be made payable to the Delaware River Joint Toll Bridge Commission, which amounts shall be forfeited as liquidated damages if the bidder or bidders fail, within ten (10) consecutive calendar days after written notice that the bidder or bidders have been awarded the contract, to enter into a written contract with the Commission in accordance with the accepted bid, and to give a Performance Bond satisfactory to the Commission, equal to one hundred percent (100%) of total amount of contract.

The Commission reserves the right to waive any informalities in the bids received; to reject any or all bids; and to award the contract only to those experienced in this class of work, and to the bidder whose proposal is deemed by the Commission to be most advantageous to the public interest.

DELAWARE RIVER JOINT TOLL BRIDGE COMMISSION
by: Alexander R. Miller
Chairman of Commission

Date, April 2, 1951

Bids: May 2, 1951

Elmira Housing Authority

PROJECT NYS 17-B
ADVERTISEMENT FOR BIDS

Sealed proposals will be received at the Office of the Elmira Housing Authority, 346 Woodlawn Ave., Elmira, N. Y., until 1:00 P.M. E.D.S.T. on May 2, 1951 and immediately will be opened and publicly read aloud.

The sealed proposals are to be for:

Contract No. 5-6—	Foundations & General Construction Work
No. 9 —	Plumbing Work
No. 8 —	Electric Work
No. 7 —	Heating & Ventilating Work
No. 13 —	Street & Yard Improvement

For Elmira Housing Project N. Y.—17B located in the City of Elmira, New York, contained in an area bounded by Clinton, Baldwin & Dickinson Streets and the Elmira Neighborhood House as indicated on detailed Site Plan included with contract documents.

On and after April 2, 1951 the contract documents may be examined at the office of the Elmira Housing Authority, 346 Woodlawn Ave., Elmira, or at the office of the Architects, Haskell, Considine & Haskell, 612 Hulett Bldg., Elmira, N. Y. Additional copies thereof may be obtained from the Architects upon payment of $25.00 as a deposit for the safe return thereof. If a proposal is submitted by the depositor, the full amount of such deposit for one set will be returned to the depositor providing the set is returned in good condition within 30 days following the date of opening bids. Upon return of additional sets in good condition within such period by a depositor who has submitted a proposal reimbursement will be made in the full amount. Sets returned by non-bidders will be reimbursed to the extent of $24.00 for each set.

Checks offered in payment for the documents shall be made payable to the order of the Elmira Housing Authority.

On a date to be selected later, approximately 10 days before bid openings a Contractor's meeting will be held at the office of the Authority, at which time all Contractors may bring up questions relating to this Project.

ELMIRA HOUSING AUTHORITY
By: J. BERTRAM COMSTOCK
Chairman

Bids: April 24, 1951

Route Dualization

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Commissioner for:

ROUTE 43, SECTION 12-C

Dualization on Route 43, Section 12C, from Hamburg Avenue, Egg Harbor City, to Union Avenue, Elwood, Mullica Township, Atlantic County. Length 4.403 miles.

Estimated:

21,600 cu. yds.	Roadway Excavation—Earth
35,600 cu. yds.	Borrow Excavation
29,000 sq. yds.	8" Gravel Shoulders
62,700 sq. yds.	5" Gravel Base Course
26,000 sq. yds.	8" Gravel Base Course
62,700 sq. yds.	3" Waterbound Macadam Course
13,333 tons	Bit. Concrete, Type MA-BC

Bids for the above will be received at the office of the State Highway Department, Assembly Room, Room 140, in the State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey, on Tuesday, April 24, 1951, at eleven o'clock (11:00 A.M.—EASTERN STANDARD TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant and equipment with their bid.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, N. J., and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Avenue, Trenton, N. J. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: R. J. Abbott
State Highway Commissioner

Bids: May 26, 1951

Installation of Steel Gratings in Garner Room and Cleaning House

THE PORT OF NEW YORK AUTHORITY
The Port Authority Grain Terminal
CONTRACT O & M 124

Sealed proposals for the Installation of Steel Gratings in the Garner Room and Cleaning House in the Port Authority Grain Terminal, foot of Columbia Street, Brooklyn, N. Y., will be received in the office of the Director of Purchase, The Port of New York Authority, Room 1402, 111 8th Ave., N. Y. 11, until 11 A.M. on Thursday, April 26, 1951, at which time and place, said proposals will be publicly opened and read. Contract documents may be obtained from the Dept. of Purchase & Special Services.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman

New York, April 12, 1951.

SEARCHLIGHT SECTION

EMPLOYMENT • BUSINESS • OPPORTUNITIES • EQUIPMENT—USED or RESALE

UNDISPLAYED RATE:
(Not available for equipment advertising)
$1.50 cents a line, minimum 4 lines. To figure advance payment count 5 average words as a line.
EMPLOYMENT WANTED & INDIVIDUAL SELLING OPPORTUNITY undisplayed advertising rate is one-half of above rate, payable in advance.
PROPOSALS, $1.25 a line an insertion.

INFORMATION.
BOX NUMBERS count as 1 line additional in undisplayed ads.
DISCOUNT OF 10% if full payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).
EQUIPMENT WANTED or FOR SALE Advertisements acceptable only in Displayed Style.

DISPLAYED—RATE PER INCH:
The advertising rate is $14.25 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.
AN ADVERTISING INCH is measured ⅞ inch vertically on one column, 3 columns—30 inches—to a page. E.N.R.

NEW ADVERTISEMENTS received by April 16th at the New York Office, 330 W. 42 St., N. Y. 18, will appear in April 26th issue subject to space available.

ENGINEERS

ELECTRICAL - MECHANICAL - STRUCTURAL

Openings in Ohio and New York offices offering long term employment with good salary for qualified Group Leaders, Designers and Draftsmen experienced in one or more of the following phases of industrial plant design:

Electrical Power, lighting layouts and electrical controls.

Mechanical Plant layout, process piping, conveyors, heating and ventilation, boiler houses, process equipment layout, refrigeration, plumbing, tanks and vessels, packaging equipment, special machinery and equipment.

Structural Structural steel and reinforced concrete.

Please submit complete resume stating experience, education, salary required and availability date.

THE H. K. FERGUSON COMPANY
Engineers and Builders

The Ferguson Bldg. 1783 E. 11th St. Cleveland 14, Ohio
19 Rector Street New York 6, N. Y.

ENGINEERS

ELECTRICAL — MECHANICAL — DIESEL

Work in mid-town section of New York City with possibility of supervision in the field at a later date.

Positions available for Project Engineers, Draftsmen, Designers, Estimators and Superintendents.

Electrical Projects—Diesel generating plants, high tension distribution, transformers, building lighting, power and signal systems.

Mechanical Engineering—Boiler plants, steam distribution, heating, ventilating, air conditioning, plumbing, sewers, water distribution.

Estimators—to prepare material schedules and detail takeoffs for purchasing.

Superintendents—to supervise installation in the field and to assist in modification of designs to suit local conditions.

Applicants—to submit outline of experience, education and other pertinent data, including availability.

GUY B. PANERO, *ENGINEERS*

1336 New York Avenue, N. W. Washington 5, D. C.
420 Lexington Avenue New York 17, N. Y.

Experience resume' to be submitted to office at 420 Lexington Ave., New York 17, N. Y.

MECHANICAL SUPERINTENDENTS — Thoroughly experienced in process piping and mechanical equipment erection, including stainless steel pressure and acid vessels, pumps, glass piping, etc.

INSTRUMENTATION SUPERINTENDENT—Experienced in repair and installation of all types of control, indicating and recording instruments.

PURCHASING AND EXPEDITING PERSONNEL —Must have plenty of experience handling requisitions and orders for mechanical equipment, piping, etc., and aggressiveness to trace and expedite and get the materials on the job.

Send outline of experience to Atlanta offices of:

JOHN J. HARTE COMPANY
284 Techwood Drive Atlanta, Georgia

WANTED

STRUCTURAL & MECHANICAL DESIGNERS & DRAFTSMEN

CHICAGO AREA
48 Hour Work Week
Send resume and earliest date available to
John Mohr & Sons
3200 E. 96th St.
Chicago 17, Ill.

CONSTRUCTION SUPERINTENDENT

Experienced in construction of Open Hearth Plants. Must be a good organizer, able to handle labor and qualified to exercise executive ability. Compensation commensurate with ability of individual.

Write and furnish full information regarding education, training, chronological details of experience, age, salary expected, etc. All replies will be considered strictly confidential.

P-9381, Engineering News-Record
330 W. 42 St., New York 18, N. Y.

ENGINEER ESTIMATOR

For general rigging and millwright work, including machinery and heavy refinery equipment installation.
Contact HENRY W. BIGGE
BIGGE DRAYAGE CO.
2387 Campbell St. Oakland 7, Calif.

GRADUATE STRUCTURAL ENGINEER

with some experience on concrete construction and capable of meeting the public. Promotional work with national organization in large midwestern city. Away from headquarters only one or two nights a week. Car furnished, expense account, good starting salary.
P-9363, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

STRUCTURAL STEEL DRAFTSMEN
DETAILERS AND CHECKERS
ONLY TOP RATE MEN
Write Qualifications
BERZIN, GEIST & LICHTENBERG
ENGINEERS
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DESIGNERS, DRAFTSMEN, ELECTRICAL - MECHANICAL - STRUCTURAL. JOB LOCATED IN MIDDLE WEST. EXCELLENT WORKING CONDITIONS. GOOD SALARY. OLD ESTABLISHED COMPANY.

P-9385, Engineering News-Record
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Write and furnish complete details of experience, training, education, background, age, salary desired, etc.

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CLEVELAND 1, OHIO

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NOW NEEDS THE FOLLOWING:

1 SUPERINTENDENT FOR STEAM ELECTRIC GENERATING STATION

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1 ELECTRICAL ENGINEER

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•

1 SYSTEM OPERATOR

The above must have experience qualifying them to operate and maintain a 652,000 kilowatt steam electric generating station which will supply power to the Atomic Energy Commission's new project at Paducah, Ky. Give experience and background in first letter. Positions will be permanent. The plant is now under construction at Joppa, Ill.

To arrange interview write:

ELECTRIC ENERGY INC.
315 N. TWELFTH BLVD.
ST. LOUIS (1) MISSOURI

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ENGINEERING and CONSTRUCTION

Large firm of Engineers and Constructors has opening in Pittsburgh for qualified Sales Engineer and Executive with contacts and recent experience in selling engineering and construction services. Submit complete information stating experience, education, personal contacts, references, date available and salary requirements. All replies will be treated confidentially.

SW-8869, Engineering News-Record
330 W. 42 St., New York 18, N. Y.

SALES ENGINEER WANTED:

to represent a well-established Fire Hydrant and Gate Valve manufacturer in the states of N. Y. and N. J. Must be an experienced salesman or have water utility operating experience. Permanent position, salary and bonus.

Interviews arranged on basis of letter stating education, experience, availability, salary desired and other pertinent personal information. If possible, enclose a recent photograph and references. Replies held in confidence.

SW-9399, Engineering News-Record
330 W. 42 St., New York 18, N. Y.

CONSTRUCTION SUPERINTENDENT

Experienced in construction of Blast Furnaces. Must be a good organizer, able to handle labor and qualified to exercise executive ability. Compensation commensurate with ability of individual.

Write and furnish full information regarding education, training, chronological details of experience, age, salary expected, etc. All replies will be considered strictly confidential.

P-9382, Engineering News-Record
330 W. 42 St., New York 18, N. Y.

Large Copper Company Chile, South America requires the following:

ASSISTANT SAFETY ENGINEER: Young mining engineering graduate. Must be single.

ASSISTANT MILL METALLURGIST: Young college graduate with some experience, to work in Mill Metallurgical Laboratory.

ASSISTANT SMELTER METALLURGIST: Young graduate in Metallurgy preferred with good working knowledge mathematics and thermo-dynamics.

CIVIL ENGINEER FOR RAILROAD DEPARTMENT: Graduate with some experience maintenance of track and track equipment, also Railroad Shop.

MECHANICAL ENGINEER FOR RAILROAD DEPARTMENT: Young graduate with shop experience in repairs diesel electric locomotives.

ASSISTANT CHIEF MECHANICAL ENGINEER: Good experience in active mechanical engineering and construction.

SENIOR FIELD ELECTRICAL ENGINEER: To work directly under Assistant Chief Electrical Engineer.

FIELD ENGINEER FOR HYDRAULIC DIVISION: To act as direct assistant to Hydraulic Engineer. Civil Engineering graduate preferred with field experience construction of hydro-electric power plants, etc.

ASSISTANT FOUNDRY FOREMAN: Young college graduate with training and some foundry experience.

PERSONNEL ASSISTANT: Young college graduate specializing in personnel work and allied courses.

The Company makes a three year contract with trans-portation paid both ways and salary while traveling. In reply give complete details.

P-9432, Engineering News-Record
330 W, 42 St., New York 18, N. Y.

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Experienced in writing specifications for commercial and industrial buildings or mechanical and process plant installations. Either a knowledge of building materials and construction trades or mechanical equipment is necessary.

Long term openings in Cleveland office offering good salary for qualified applicants. Apply in person or send complete resume of experience, education and salary expected.

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Engineers and Builders
Ferguson Building
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PROJECT ENGINEER
For Construction of
STEEL MILL FACILITIES
Minimum of 5 years' experience on heavy construction

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SAN FRANCISCO: 68 Post St. (4)

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POSITIONS VACANT

WANTED: STRUCTURAL Engineers for pulp and paper mill design including mill layout and structural steel and reinforced concrete design. In first letter give complete engineering experience, age, education, etc. Address Construction Engineer, P. O. Box 1844, Savannah, Ga.

CONSTRUCTION EXECUTIVE Engineer: Capable of Office Management, estimating, buying sub-contracts, materials, solicitation of new business and field management. Unusual opportunity for aggressive person with proper qualifications. Give full experience, salary expected, age and availability in first reply. Joseph Skilken & Company, 44 E. Broad Street, Columbus 15, Ohio.

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STRUCTURAL STEEL Detail Draftsmen and Checkers. All types of Structures. Vacation and bonus plan, group insurance, good working conditions. Only top quality men. Send complete written information. Samborn, Steketee and Associates, 1214 Cherry Street, Toledo 2, Ohio.

RESEARCH ENGINEER: Nationally known top-rated manufacturer desires services capable development engineer fully experienced metal panel construction for building walls, floors and roofs. Consideration given only to top flight man capable originating and developing to successful conclusion new ideas and improvements this field. Creative ability essential. Remuneration consistent past performance and future accomplishments. Give full particulars, photo and references. P-9351, Engineering News-Record.

WANTED: PIPING Draftsmen, structural engineers, industrial engineer. Murray Hill 3-7484. (N.Y.)

EXPERIENCED HIGHWAY and railroad location engineers. South American assignment 12 months. Reply with age and experience resume. P-9438, Engineering News-Record.

POSITIONS VACANT

SUPERINTENDENT-ENGINEER for General Building Contractor doing light industrial and commercial work on Long Island. A good opportunity to become a member of an organization with excellent prospects. Man wanted must be well rounded for leadership and production on job and in office. State salary. P-9448, Engineering News-Record.

WANTED: SUPERINTENDENT for work in N. Y. area. Must be capable of supervising all phases of Highway and Heavy Construction. State age, experience and references. P-9433, Engineering News-Record.

WANTED: CHIEF Engineer and Estimator by a long established General Contractor doing a large volume of heavy and highway construction work in New York area. Must be 45-55 yrs., experienced in estimating prices as well as quantities. State age, experience and qualifications. P-9434, Engineering News-Record.

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ENGINEER CONSTRUCTION C.E. Graduate, 25 years office and field experience design construction all types structures. Estimating, pricing, closing contracts, coordination. Wishes position as contractors' engineer or architects' representative. Some foreign experience. Locate anywhere. PW-9312, Engineering News-Record.

PROJECT MANAGER, general superintendent. Experience includes all details of entire heavy and light building and allied constr. 30 yrs. exp. Salary $12,000 per year. PW-9329, Engineering News-Record.

ASPHALT SUPERINTENDENT, 30 years experience, asphaltic concrete, binder sheet top, and water bound macadam bases, application, both hot and emulsified asphalt, familiar, Warren Cummer, H-B., and Simplicity Plants, married, sober, and free to travel. PW-9346 Engineering News-Record.

SUPERINTENDENT—20 Years experience, Operation & Maintenance, Water Wks, Sewage, Stream Pollution, Chemical & Non-Metallic Mineral Plants. Also Construction, Mechanical Installation and all types of Heavy Equipment. Will relocate. Write Box 2202, Richmond, Virginia.

MASTER MECHANIC. Equipment Supt., over 25 years experience with erection, repair, maintenance heavy industrial, power house, pumping stations, marine equipment. P. Cornwell, 6824 Colonial Rd., Brooklyn 20, N. Y. TErrace 6-6236.

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ARCHITECT. EXECUTIVE, project manager and contact man. 23 years experience in architecture, general contracting, engineering, and property management. Graduate, Reg. Intered. PW-9454, Engineering News-Record.

SUPERINTENDENT OF Erection. 38 years experience with erection of structural steel, tanks, conveyors, large pipe lines, traveling machinery, and arc welders. Will go anywhere. Preferably the West. PW-9411, Engineering News-Record.

SANITARY ENGINEER—Capable of assuming responsibility for reports and planning of sewage and water works. Desires position with Consulting Engineer offering opportunity of eventual admission to firm. Present income: $8660 per annum. PW-9439, Engineering News-Record.

ESTIMATOR, ASSISTANT Superintendent, field engineer Associate Member A.S.C.E. Registered New Jersey. 25 years experience streets, state roads, bridges, all types buildings. Prefer North Jersey or Long Island. Available April 15. PW-9422, Engineering News-Record.

CONSTRUCTION ENGINEER, Graduate C.E., Reg. Prof. Engr. 18 years construction experience, 10 of which as Supt. of Const. Heavy Construction, Pile driving, treatment plants, etc. can estimate, supervise, organize, plan, buy materials—everything from estimate to finish—age 38—will work anywhere—also have sales ability. PW-9420, Engineering News-Record.

POSITIONS WANTED

STRUCTURAL AND Hydraulic engineer 48, design supervision and construction desires interviews during current year with employment view. PW-9409, Engineering News-Record.

PUBLIC RELATIONS and Salesman for Construction Company. Experienced selling earth moving and heavy equipment. Excellent contacts throughout the East. PW-9406, Engineering News-Record.

STRUCT. ENG'R.—BSCE; draft-exempt; 1 yr. experience in heavy bldg. constr. and 2 yrs. in bridge design (reinf. conc. and struct. steel); presently employed in design; location immaterial. PW-9461, Engineering News-Record.

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1—HD-14 Bulldozer, 1946 Model . . . $5,000.00

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Phone: 59571

WANTED

Additional Wanted Advertising on Page 123

WANTED

40—11½ Cubic Yard Muck Cars 24" Gauge
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1—200 Ton Aggregate Bin equipped with scales
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2—Model T. D. Euclid End Dump

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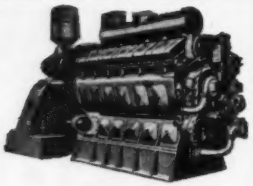

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1250	General Motors	16-278A	1600	720	312	General Motors	8-268A	450	1200
937.5	General Motors	12-567	1080	720	312	Clark	MD-4	375	327
625	Alco	6-12½x13T	750	600	125	General Motors	3-268A.	150	1200
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All of the above complete for the sum of $7,500.00

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TD-18 Tractor with Bucyrus-Erie hydraulic blade, new 1949 condition excellent.
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(2) D8 Caterpillar Tractors
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FS-9193, Engineering News-Record
330 W. 42 St., New York 18, N. Y.

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Schramm 105 cubic foot gas powered compressor on 4 steel wheels.
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Worthington two-stage, water-cooled, vertical 250#, 60 CFM, new condition.

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1½-ton Ford with any body.
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New and rebuilt dump bodies.
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New and rebuilt dump bodies.

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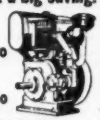

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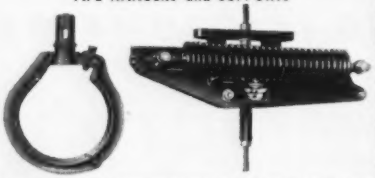

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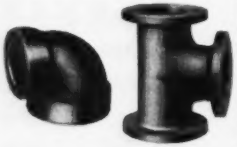

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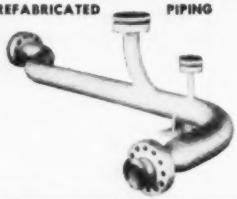

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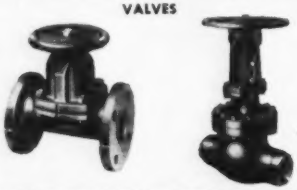

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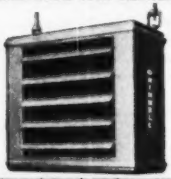

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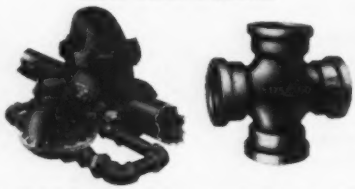

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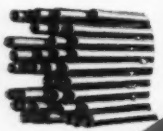

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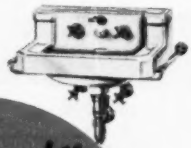

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NEW PRODUCTS

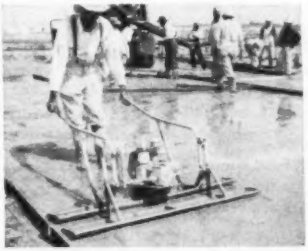
Loader on tracks features one-unit design

Machine on tracks is designed specifically as a bucket excavator and loader, and not as a dual-purpose unit for use with other equipment. Built by specialists in the manufacture of rubber-wheeled loaders, company officials claim there is a definite need for this type of unit for basement digging, other odd excavation jobs, and for bulldozing. Crawler traction provides more crowd power when needed, and permits shorter turns and greater maneuverability in cramped working spaces. They believe there is a place for a rugged machine of this type for heavy-duty operations and where high travel speed around the job and between jobs is not an important factor.

Engine is mounted at the rear for better balance and weight distribution against the bucket load in front. Operator sits at the front where he has a full view of his work. Five forward speeds (1.6 to 5.6 mph) are matched by five reverse speeds at slightly higher ratio (2.1 to 7.3 mph) for fast back-up. Boom and bucket are both hydraulically controlled.

The T12 Payloader uses modified International T-9 tractor crawlers, and by placing the engine at the rear, balance point of the machine under load is only 2¼ in. ahead of that of a bare TD-9 tractor.

Present models have conventional shifts, but the company is working on a clutching system that will provide direct shift from forward to reverse in corresponding speeds by a directional-control lever. The bucket is rated 0.88 yd struck, and 1.17 yd heaped. From digging or bulldozing position, it automatically returns to level position at carrying height, and remains level as the boom is hoisted to maximum height. Rated bucket load is 3,000 lb; maximum static load is 4,000 lb. Power is provided by an International U269 diesel rated at 67 hp. Lifting time to full height is 8 sec. Dumping and lowering time is 3 sec. each. Operating weight is 17,900 lb. Track tread is 5 ft. Tracks are 15 in. wide with overlapping flat track shoes. Dimensions are: Height over exhaust, bucket at carry position, 6 ft 2¾ in.; width, over bucket, 6 ft 3¾ in.; length, bucket at carry position, 16 ft. 11¼ in.—The Frank G. Hough Co., 832 Seventh St., Libertyville, Ill.



Concrete tamping machine

New gasoline-powered RoboTamp "walks" across screeded concrete, tamping with an even pressure as it moves. Positive action is said to force aggregate down eliminating work-up of particles.

(Continued on page 127)

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Burns 40 hours on 6 pints of Kerosene

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"... We have used these forms (ATLAS SPEED FORMS) about 525 times ... still in good condition. So much so that our intentions are to use them approximately 400 times more with only minor replacements."
HOWARD C. GRUBB
Building Contractor
Tulsa, Oklahoma

Cost to Howard C. Grubb: ½¢ per sq. ft. per use!

IRVINGTON FORM & TANK CORP.
Irvington 31, N. Y.

Send more information. I am interested in forms for_____
Name_____
Firm_____
Address_____

Only the TIMKEN Company offers all 3 rock bit types...

and a complete Rock Bit Engineering Service!

WHATEVER you're looking for in a rock bit—lowest bit cost, lowest cost per foot of hole, greatest possible drilling speed, or any other advantage—you're sure of getting it from the Timken Company. We're the only rock bit makers who offer you all three types—the only company that can give you an unbiased recommendation for the best bit for your job:

1 **MULTI-USE**—gives lowest cost per foot of hole when full increment of drill steel can be drilled and when control and reconditioning of bits are correct.

2 **CARBIDE INSERT**—for extremely hard and abrasive ground. Drillers spend less time changing bits.

3 **ONE-USE "SPIRALOCK"**—for use where reconditioning is impractical or undesirable. Lowest unit cost. Has revolutionary new "Spiralock" union.

Along with a complete selection of bits, the Timken Company gives you the only complete Rock Bit Engineering Service. And it's backed by more than 17 years' experience in solving rock bit problems.

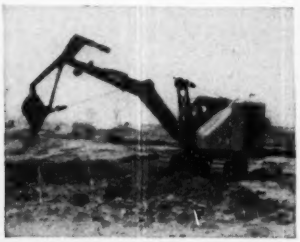
FREE BOOKLET! A valuable guide for every rock bit buyer. Shows full line of bits with detailed descriptions, recommended uses. Write The Timken Roller Bearing Company, Rock Bit Division, Canton 6, Ohio. Cable address: "TIMROSCO".

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

your best bet for the best bit
... for every job

Power is provided by a ¾-hp engine. The RoboTamp weighs 60 lb, and is said to tamp up to 18,000 sq ft of concrete per hr.—CLEMENT MFG. CO., 304 EQUITABLE BLDG., HOLLYWOOD 28, CALIF.



Gooseneck-boom hoe

Model 150 ½-yd-capacity trench hoe is equipped with a gooseneck boom. This design permits the use of a 2-part hoist line, and is said to result in higher speeds and greater digging depths. The 150 is adaptable to use as a shovel, dragline, clamshell, or crane. Low-gear transmission provides a greater amount of power for tough-digging conditions. Special hoe-stick linkage provides a chopping action. — HARNISCHFEGER CORP., 4404 W. NATIONAL AVE., MILWAUKEE 14, WIS.

Snow-casting chute

Hydraulically controlled revolving snow-casting chutes can be aimed by the operator in any direction. Both chutes can be aimed in the same direction; or individually to any direction to take best advantage of wind direction or to place excess snow in the most desirable location. The chutes turn a full 360 deg, and are controlled from the cab by a hydraulically driven motor. — WM. BROS BOILER & MFG. CO., 1057 TENTH AVE., S. E., MINNEAPOLIS 14, MINN.

Radiant-heat thermostat

Surface-type Thermoray thermostat is sensitive to convection air temperature and effect of radiant panels. It functions according to effective temper-

(Continued on next page)

How to keep Line "FEATHERS" out of your hair!

It was a clean, sharp line till it had to be erased. But when it was re-inked, brother how it feathered and "blobbed"!

Feathering lines are one of the things you *don't* have to worry about with Arkwright Tracing Cloth. Even erased surfaces will take a neat, sharp line. What's more, you'll never find pinholes, thick threads or other imperfections in Arkwright cloth. You'll never have to fear that your drawings will discolor, go brittle or become opaque with age. A drawing on Arkwright Tracing Cloth will yield clean, clear blue-prints years after you make it.

Aren't your drawings worth this extra protection? Arkwright Finishing Co., Providence, R.I.

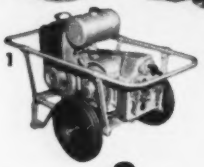
ARKWRIGHT *Tracing Cloths*

AMERICA'S STANDARD FOR OVER 25 YEARS

JACKSON SIDE-FORM VIBRATOR

CUTS COSTS • SAVES LABOR • INSURES A BETTER JOB

Eliminates



MANUAL VIBRATING of concrete at side forms. Saves the better part of two men's labor. Mounts on any modern finisher, Jackson Vibratory Paving Tube or Spreader. Employs two or more vibratory units that are simultaneously lowered into or raised from the concrete by the finisher operator. Units operate close to forms or reinforcement without fouling — ride over any obstruction encountered. Will not penetrate into sub-base. Assures thorough compaction regardless of speed of finisher or spreader . . no spots missed. Long-wearing, trouble-free.

JACKSON

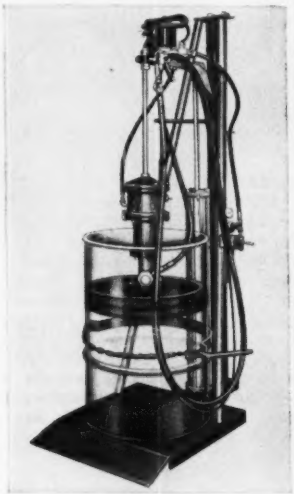
IDEAL FOR EVERY TYPE OF JOB

1. Power Plant used with Compactor and Screed, 1.25 KVA. Others of 2.5 and 5 KVA capacity — all produce both single and 3-phase 110 v. 60 cycle AC and have generators requiring no maintenance or adjustment. 2. Hydraulic vibrator with time-saving 50' reach. 3. Powerful, easy-to-handle electric vibrator — shafts up to 28'. 4. Finest of engine-driven flexible-shaft vibrators. 5. Revolutionary, fast, granular soil vibratory compactor. 6. Heavy-duty mass construction vibrator — a "must" on dams, etc. 7. Electric vibratory screed — most productive of all screeds for municipal paving, highway widening, etc. Write for "Pocket Guide" describing the entire line.

FOR RENT OR SALE AT JACKSON DISTRIBUTORS

ELECTRIC TAMPER & EQUIPMENT CO.
LUDINGTON MICHIGAN

ature, and is part of the Sarcotherm control system for hot-water radiant heating. It can also be used effectively for controlling electric radiant heating panels. The Thermoray instrument can be used for line or low-voltage circuits, and can be furnished with double-switch action for any special control sequence.—SARCOTHERM CONTROLS, INC., EMPIRE STATE BLDG., NEW YORK 1, N. Y.



Mastic-materials pump

Hydraulically operated pump delivers heavy lubricants and mastic materials that will not readily seek their own level. The unit exerts 7,110 lb pressure, and is said to completely empty and clean sides of 400 lb or 55-gal drums. Built-in chain with toggle clamp holds drum in position on elevator platform.—LINCOLN ENGINEERING CO., 5702-20 NATURAL BRIDGE AVE., ST. LOUIS 20, MO.

Long-bowl rope socket

Manganese-steel rope socket has wedge and socket grooves corresponding to the correct rope diameter to prevent distortion and crushing of the rope. Crushing and distortion are further guarded against by the combination of long-bowl design and increased

(*Continued on page 130*)

16" and UP

If your requirements call for transmission or distribution mains of 16" diameter or larger, Lock Joint Pipe Company can provide high quality concrete pressure pipe in all standard diameters and some intermediate sizes. Starting at a minimum of 16", Lock Joint Concrete Pressure Pipe is produced in 32 different diameters, and its four distinct types of structural design cover every working condition common to American water works practice.

Not only does Lock Joint Concrete Pressure Pipe qualify fully under A.W.W.A. specifications, but it alone embodies, in a conventionally designed pipe priced to meet competition, all the nine time-tested characteristics listed at right:

- **PERMANENT HIGH CARRYING CAPACITY**
- **PROOF AGAINST TUBERCULATION, CORROSION AND ELECTROLYTIC DAMAGE**
- **IMMUNITY TO RUPTURE OR BLOW-OUT**
- **SAFETY UNDER EXTREME EXTERNAL LOADS**
- **EVERY JOINT FLEXIBLE AND WATERTIGHT**
- **EASILY TAPPED**
- **SPECIALS TO MEET INDIVIDUAL SPECIFICATIONS**
- **USEFUL LIFE CONSERVATIVELY ESTIMATED AT 100 YEARS**
- **MINIMUM MAINTENANCE AND REPAIR COSTS**

Whether your proposed line is large or small it will pay you to use Lock Joint Concrete Pressure Pipe, the pipe of proven durability, economy and dependability.

SCOPE OF SERVICES—Lock Joint Pipe Company specializes in the manufacture and installation of Reinforced Concrete Pressure Pipe for Water Supply and Distribution Mains in a wide range of diameters as well as Concrete Pipes of all types for Sanitary Sewers, Storm Drains, Culverts and Subaqueous Lines.

LOCK JOINT PIPE COMPANY

Est. 1905

P.O. Box 269, East Orange, N. J.

PRESSURE PIPE PLANTS: Wharton, N. J., Turner, Kan., Detroit, Mich.

BRANCH OFFICES: Casper, Wyo. • Cheyenne, Wyo. • Denver, Col. Kansas City, Mo. • Valley Park, Mo. • Chicago, Ill. • Rock Island, Ill. Wichita, Kan. • Kenilworth, N. J. • Hartford, Conn. • Tucumcari, N. Mex. Oklahoma City, Okla. • Tulsa, Okla.

IN ONLY 5 "QUICK" MINUTES IT'S

DETACHED, LOADED & RE-ATTACHED

Ready to GO!

ROGERS

POWER LIFT

DETACHABLE GOOSENECK

TRAILER

PATENTS PENDING

Frame is lowered to ground without need of blocking. Maximum height of 16" assures rapid, safe loading of equipment.

Complete Literature available upon request—Any Rogers Dealer will demonstrate its features right on your desk, with an OPERATING SCALE MODEL.

DEVELOPED BY

The Trailer Pioneers

ROGERS BROS. CORP.

ALBION, PENNA.

RAISES ITS DECK TO CLEAR HIGH BANKED CROSSINGS

STOOPS TO CLEAR LOW OVERHEAD OBSTRUCTIONS

CARRIES HEAVIER LOADS MORE PROFITABLY ON LARGER TIRES

Rogers Tilt-Top trailers embody a special shock absorber which cushions the loading and unloading action. Various sizes available.

wedge angle (wedge grips a length equal to six times the rope diameter). Sockets in sizes up to and including 1¼ in. accommodate two rope sizes using the same wedge. Sizes 1¼ to 2¾ in. use wedges individually varied in eighths of an inch.—ELECTRIC STEEL FOUNDRY CO., 2167 N. W. 25TH AVE., PORTLAND 10, ORE.

Diesel pile hammer

Improved self-contained diesel pile hammer (described for the first time in our issue of Sept. 8, 1949, p 68) requires no auxiliary equipment, such as steam boilers or air compressors, to maintain pressure. It is 15 ft 6 in. long, has a 20-in. dia, and weighs 11,000 lb. The hammer delivers driving energy at the rate of 16,000 ft lb/stroke, and is capable of 85 strokes per min. Weight of the ram or the striking part is 5,400 lb; maximum power stroke is 4 ft. Hammer fits in standard 20-in. leads, and can be easily handled by a gasoline or diesel-operated crane. It requires two lines—one for lifting the hammer; the other for lifting the pile and for starting the hammer by lifting its piston. One-man operated, force of each blow is remotely controlled by a hydraulic system and can be varied from zero to full power. Unit will idle without impact and without stalling.—SYNTRON CO., 328 LEXINGTON AVE., HOMER CITY, PA.

Asphaltic pipe coating

Gilsonite-asphalt-base asbestos-fiber coating is formulated expressly for use where corrosion from soil acids or air-suspended acids attack metal structures or pipelines. Pro-Tek-To coating is designed for cold application and requires no heating, special mixing, or preparation. It can be applied by brush, or by special pipe-coating machinery.—THE WARREN REFINING & CHEMICAL CO., 750 PROSPECT AVE., CLEVELAND 15, OHIO.

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TO GIVE YOU MORE YEARS OF PROFIT

P&H MAGNETORQUE* ELECTRIC SWING

SAVES YOU TIME, TROUBLE, MONEY!

Bring on your heaviest going! The 955-A is ready for it! It's the 2½ yd. companion of the famous P&H 1055 — with all its proved engineering — tough all-welded construction — greater stability — live roller circle — adjustable hook rollers — and many other advancements that assure years of hard service with minimum cost.

Operating advantages? More than you've ever known in a machine of its size. Magnetorque Swing does away with the old swing frictions — with all their headaches — forever. It's faster — 15% to 25% faster.

Ask us where you can see one in operation. Learn what "ROCK RATED" really means.

*T. M. of Harnischfeger Corporation for electro-magnetic type clutch.

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4404 West National Avenue
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HARNISCHFEGER CORPORATION

EXCAVATORS • OVERHEAD CRANES • HOISTS • ARC WELDERS AND ELECTRODES • SOIL STABILIZERS • CRAWLER AND TRUCK CRANES • DIESEL ENGINES • CANE LOADERS • PRE-ASSEMBLED HOMES

MARION
BODIES AND HOISTS

Symbol of Excellence in

A special 22 cubic yard capacity Marion Body with Telescopic Hoists—installed on a tandem semi-trailer.

Hydraulic Hoists Hydraulic Hoists—Through sound engineering and skillful use of high quality materials, Marion has produced a variety of standard and special hoists for efficient dumping service. Marion's extra attention to detail pays off "on the job" in dependable, economical . . . more profitable operation.

Dump Bodies Dump Bodies—Marion bodies are designed with built-in endurance to withstand the hard knocks of heavy haulage duty. Marion's stronger, all-welded construction means longer body life, less maintenance cost . . . real over the years dependability.

Your near-by Marion distributor can furnish genuine Marion parts and factory "know-how" for your service and repair needs. It pays to deal with an authorized Marion distributor.

MARION BODIES AND HOISTS
MARION METAL PRODUCTS CO.
MARION, OHIO, U. S. A.

Standard and Special Hoists and Dump Bodies for Light, Medium, and Heavy-Duty Service

MANUFACTURERS' PUBLICATIONS

Caterpillar products—Forty-page booklet, published annually, contains a complete listing with pictures and brief specifications of the current Caterpillar line of equipment. Of the eleven new models announced during 1950, all but two are included in Form 30081. Applications photos show the equipment in use.—CATERPILLAR TRACTOR CO., PEORIA 8, ILL.

Nordberg machinery—All types of equipment manufactured by Nordberg are listed in this 28-p catalog. Items listed in Bulletin 187 include: 2 and 4-cycle diesels, gasoline marine engines, Symons cone crushers and screens, mine hoists, and air and gas compressors. In addition, the bulletin gives the historical background of the company, and describes its manufacturing facilities.—NORDBERG MFG. CO., CHICAGO & OKLAHOMA AVES., MILWAUKEE 7, WIS.

Worthington bulletins—Four catalogs are announced by Worthington. Bulletin W-212-B6 describes the Type CM precipitating softener and coagulator. Bulletin S-500-B52A describes the DR diesel engines. Bulletin H-1200-B42 describes the WJ-45 and WJ-55 hand-held rock drills. Bulletin R-1700-B5 describes the 35S dual-drum tunnel mixers.—WORTHINGTON PUMP & MACHINERY CORP., HARRISON, N. J.

Welding data—Wall chart (12x18 in.) is designed to aid welders in selecting the particular welding, brazing, soldering, cutting, or tinning alloy and flux for a specific job. Data are arranged to make accurate selection as nearly automatic as possible. Also available is a

(*Continued on page 135*)

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(Since 1915)

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District Branch Offices

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George R. Lewis Co., 2036 Queen Ave. S, Minneapolis 5, Minn.
B. H. Mueller Co., 6625 Delmar Blvd., St. Louis 5, Mo.
Ole K. Olsen Co., 823 Perdido St., New Orleans, La.
Philip D. Barnard, 2036 Addison, Houston 8, Tex.
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Wood Preservers Since 1878
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PRESSURE TREATED
TIES—POLES—PILING—LUMBER
WITH
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TREATING PLANTS
Jacksonville, Fla. Norfolk, Va.
Eddington, Pa.

GENERALS

do any job, anywhere — FASTER! EASIER! AT LOWER COST!

GENERAL L. C. M.

For most work off the road, some on. Broad, deep lugs and thick, rugged shoulders prevent cuts, snags, bruises. More rayon cords, more rubber for extra carcass strength.

GENERAL H. C. T.

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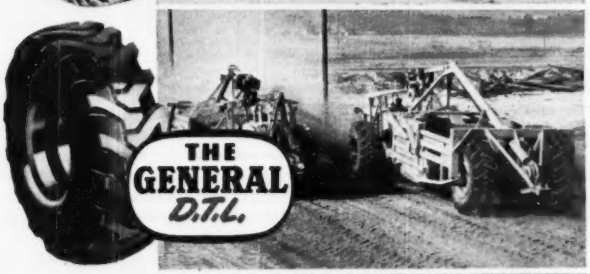
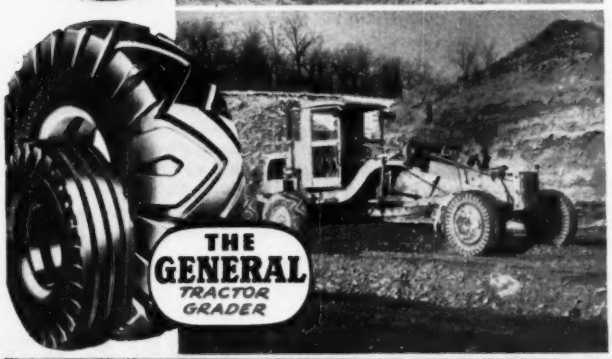


GENERAL DUAL TRACTION LUG

To move more yards of dirt, the General Dual Traction Lug digs deep for more traction in soft going, forward or backward. Makes heavy jobs easy.



GENERAL TRACTOR GRADER TIRE

For power wheels—sharp, diagonal, self-cleaning tread bars for maximum traction, forward or backward. For front wheels—easy steering, smooth riding ribs.

SPECIFY GENERAL TIRES ON YOUR NEW EQUIPMENT

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Symbol of Excellence in

A special 22 cubic yard capacity Marion Body with Telescopic Hoists—installed on a tandem semi-trailer.

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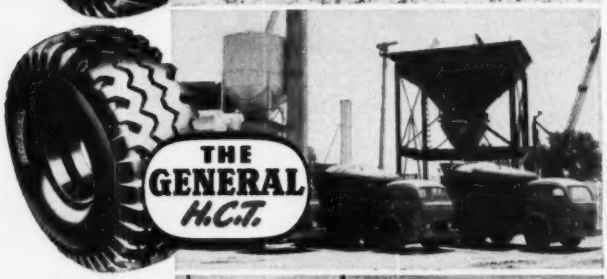

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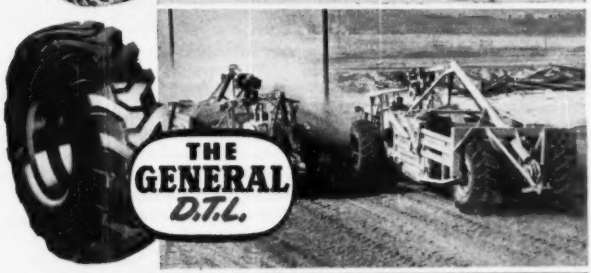

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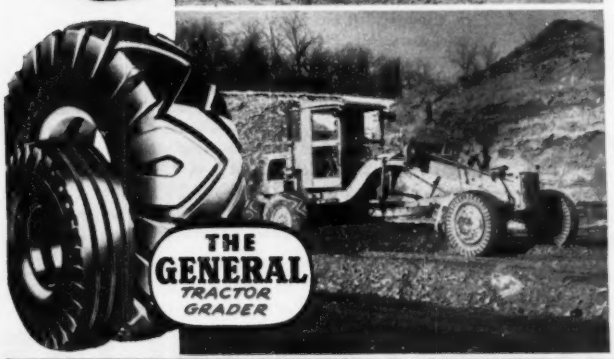

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For power wheels—sharp, diagonal, self-cleaning tread bars for maximum traction, forward or backward. For front wheels—easy steering, smooth riding ribs.

SPECIFY GENERAL TIRES ON YOUR NEW EQUIPMENT

Tops in sales because they keep costs down!

Month after month, year after year, International Trucks cut hauling costs and give you better on-the-job performance.

Where's the proof?—in the carefully-kept cost records of heavy-duty haulers; the same men who have kept Internationals first in heavy-duty truck sales for 19 years. Their records are black-and-white proof that Internationals give you lower operating and maintenance costs even on the toughest jobs.

Where's the pay-off for you?—every new International Truck is *heavy-duty engineered* with extra stamina in every part to give you this same cost-cutting performance with longer truck life on *your* job.

You get the right truck for your job

When you buy a new International Truck you don't gamble with a "misfit" truck. You get the engine, the transmission, the axle, *everything* specialized to fit your particular job. You get a truck that's built to last and give you more efficient on-the-job performance. That's why over half the Internationals built in the last 45 years are still in operation.

You get a truck that drivers go for

The better a driver likes his truck, the better care he takes of it. That's why every new International is specialized from the driver's standpoint, too. An all-new steering system gives the driver more positive control from a more comfortable position. New Super-maneuverability lets him turn in the shortest *practical* circles—helps him in the tight spots.

The new Comfo-Vision Cab is the "roomiest cab on the road." It has mighty comfortable, fully-adjustable seats. And the driver enjoys full-front visibility through the one-piece Sweepsight windshield.

With 87 basic models, thousands of specialized variations, in the world's most complete line of trucks, you're sure of getting the right truck for your job. See the new International Trucks at your nearest International Truck Dealer or Branch *now*.

International Harvester Builds McCormick Farm Equipment and Farmall Tractors . . . Motor Trucks . . . Industrial Power . . . Refrigerators and Freezers

International Harvester Company • Chicago

See the new

INTERNATIONAL TRUCKS

Every model heavy-duty engineered for the long haul

folder devoted to purchasing data containing information on how to enter orders.—ALL-STATE WELDING ALLOYS CO., INC., 273 FERRIS AVE., WHITE PLAINS, N. Y.

Manual valves—Catalog covers the entire range of Shear-Seal valves including shut-off, selector, and manipulator valves for pressures from 0 to 6,000 psi. It contains explanatory copy and illustrations of the Shear-Seal principle featuring a pressure-balanced self-aligning tubular valve seat. An outline shows how to determine proper valve size, and tables list steel pipe data and capacities of hydraulic rams.—BARKSDALE VALVES, 1566 E. SLAUSON AVE., LOS ANGELES 11, CALIF.

Radial-arm saws—Woodworking ideas for contractors are illustrated and described in this 12-p catalog. The center spread illustrates some of the 125 different operations that can be performed with radial-arm saws. Catalog M-50 features a description of the various Delta saws and accessories.—ROCKWELL MFG. CO., DELTA POWER TOOL DIV., 600 E. VIENNA AVE., MILWAUKEE 1, WIS.

General-purpose pumps—Comprehensive catalog covers a broad line of horizontal Fluidyne general-purpose pumps. They afford a capacity range from 10 to 5,500 gpm. Liquids can be pumped against heads up to 260 ft. Two types are listed in Bulletin B-2300—closed-coupled electric-motor driven; and a bracket-mounted pump for driving through a flexible coupling, V-belt, or flat-belt pulley.—PEERLESS PUMP DIV., FOOD MACHINERY CORP., 301 WEST AVE. 26, LOS ANGELES 31, CALIF.

Rope and chain fittings—Revised and enlarged data book combines engineering information with an extensive catalog of a complete line of wire rope and chain fittings. In addition to presenting detailed working characteristics of each product to aid in selection of the proper fitting, Catalog 150 features tables and charts that make it a valuable reference book.—THE THOMAS LAUGHLIN CO., PORTLAND 6, MAINE.

Laminated lumber spex—"Standard Specifications for the Design and Fabrication of Structural Glued Laminated Lumber" is available in booklet (8 pp) form. Basis for the specifications is data developed by research of the Forest Products Laboratory, U. S. Dept. of Agriculture.—WEST COAST LUMBERMEN'S ASSN., 1410 S.W. MORRISON ST., PORTLAND 5, ORE.

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Letter from Hartford

It didn't match a Kefauver crime investigation session in entertainment value; nor was it as dull as a parley of Big Four deputies haggling over agenda. But the meeting in Hartford, Conn., bore resemblance to both.

The New England-New York Inter-Agency Committee was in official session to press its investigation into regional resources. Indigenous Yankee wit kept the session from being what it might have been: A slow plodding—without very apparent progress—through the haze of a still-not-crystallized study that has until June '54 to wind up.

• **Connecticut view**—Tall, suave John Davis Lodge, governor of Connecticut, set the tenor in welcoming the 15 committeemen and the capacity crowd of spectators that packed the small, close Egyptian Room in the Bond Hotel.

In a presentation that could well have been written by his state's acute committee member (Richard Martin of the Connecticut State Water Commission), Governor Lodge took care of the amenities, then asked the committee to endorse two issues now pending: The Connecticut River Compact, now up for approval in four state legislatures (Massachusetts and Connecticut, downstream beneficiaries, would reimburse Vermont and New Hampshire for loss of taxes on real estate given over to future flood control projects); a power development at Enfield Rapids on the Connecticut, now awaiting Army and Federal Power Commission okay before private interests can proceed on it.

• **Down to business**—As the governor took his leave, Col. Frederic F. Frech, Army representative and committee chairman, got things under way—rather stiffly at first—with a statement outlining committee objectives and progress.

Four fields of study had so far been decided upon, said Frech: Agriculture, fish and wildlife, mineral resources and pollution control. Also, three subcommittees (on economics, hydrology and mapping) had been set up to service all study groups with needed information.

First order of business for the Hartford meeting was to approve a list of seven more subjects to be studied: drainage, flood control, navigation, power, public health (including insect control), recreation and water supply.

• **Trouble**—Study areas needed defining—and this was a tough one. They wouldn't be the same for all subjects, it was explained. Water supply and navigation would necessarily include whole river basins; recreation, mineral, fish and wildlife studies could stop at state lines.

This brought to his feet the gentleman from New York State, a stand-in named Hickman Powell, there in place of J. E. Burton of the New York State Power Authority.

Mr. Burton, said Mr. Powell, is worried over the partition of his state. He had taken pen in hand (and possibly put tongue in cheek) to write a statement denouncing annexation of most of New York state to New England for study purposes, while excluding rivers flowing into Pennsylvania and New Jersey from water-use study, and barring New York City from water-supply investigation.

• **They parry to lunch**—Colonel Frech parried—said he would consult with Burton on the apparent differences. And the committee accepted, without further objection, a division of the region into three general study areas (Maine, the rest of New England and New York).

Leland Olds, Interior's full-time representative on the committee, helped to whet listeners' appetites with a detailed discussion of Connecticut oyster and lobster output.

Lunch finally came. New Englanders around the table commented that lobsters taken in Connecticut waters each year wouldn't even supply the Hotel Bond, that the ones being eaten were probably natives of Nova Scotia.

• **Action taken**—A seemingly much revived committee returned from lunch to answer Connecticut's request by refusing to pass on Enfield Dam; endorsing the flood control compact with a statement that their survey would not be prejudiced by its approval.

Mr. Martin expressed Connecticut's appreciation, claiming that the states involved have the four largest legislatures in the land, and when the Congressmen who must ratify the proposed compact are added, the number of people still to be sold on it totals 1,818.

A Dr. Smith read a paper on soil studies in New England. He earned an unenthusiastic "Thank you, Dr. Smith," from the chair.

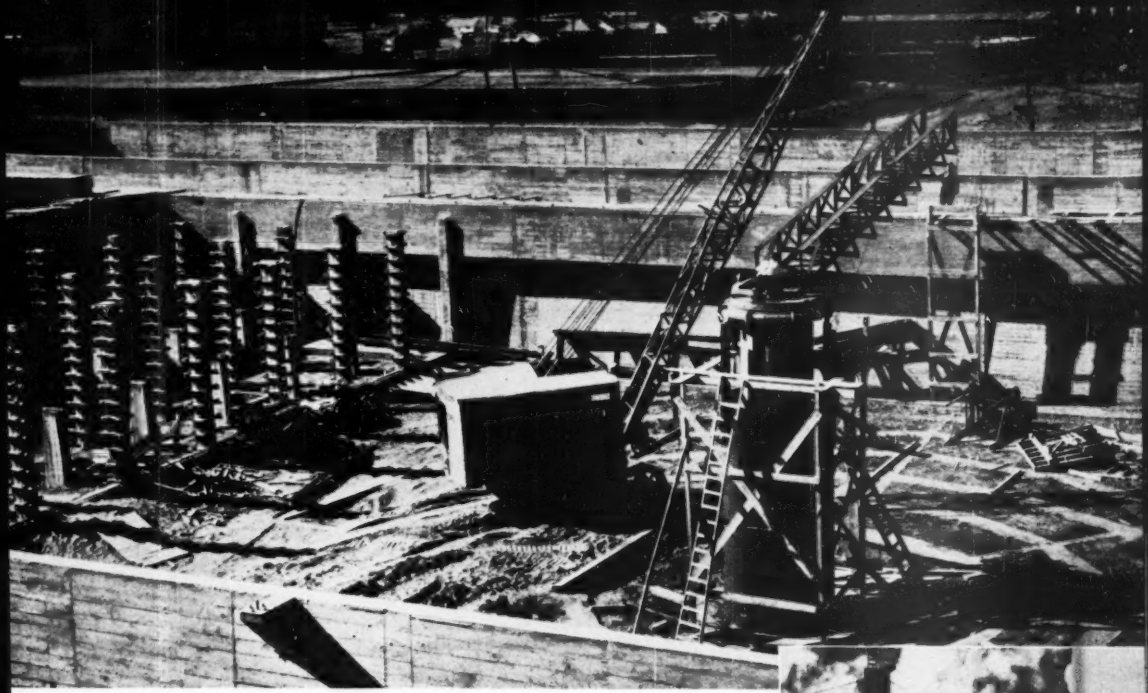
Mr. Martin somehow got the floor with the story of the fellow who remarked the wonders that God and man had wrought in reclaiming a certain piece of land, only to be told he should have seen it when God was working it alone.

Colonel Frech observed that "That sounded like a benediction" and seized the opportunity to bring the session promptly to a close.

"Thanks for your courtesy and tolerance," he said. "As time goes by we hope to be hitting the ball a little harder."

Undoubtedly.

TWO AND TWO—Col. Frederic F. Frech, chairman of the New England-New York Inter-Agency Committee talks with Richard Martin of the Connecticut State Water Commission. In the background: two unidentified Egyptians.



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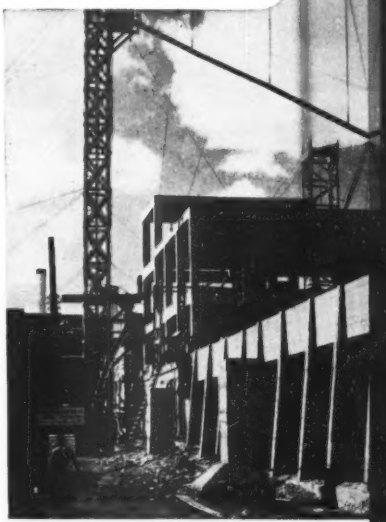

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